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contents

VOLUME 48 MAY 18, 1959 NUMBER 10

special articles

Package Dyeing Blended Yarns of 80% Zefran and 20% Cotton or Rayon 35
Robert L Burgess
Central Notations for Color-Name Blocks 38

aatcc proceedings

featured articles

Reactive Dyestuffs 39
Ernest L Caswell
Recent Advances in the Dyeing of Acrilan Acrylic Fiber 41
E V Burnthall
Use of Polyethylene Emulsions in Textile Applications 46
R Rosenbaum

miscellaneous

198th Meeting—Technical Committee on Research 51
Future Papers 50
AATCC Calendar 55
Intersectional Contest Rules 56
Convention Notes 57
Elected to Membership 57
Membership Applications 58
Activities of the Local Sections 59
Organization of the AATCC 60

departments

Abstracts 37
Inter Alia—Inter Nos 61
P J Wood
Patent Digest 63
Paul Wengraf
News of the Trade 71
General Calendar 74
New Products and Developments 76
Names in the News 77

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AMERICAN

DYESTUFF REPORTER

Volume 48 May 18, 1959 Number 10

PACKAGE DYEING BLENDED YARNS OF 80% ZEFRAN AND 20% COTTON OR RAYON

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INTRODUCTION

One of the most promising applications for The Dow Chemical Company's new acrylic fiber, Zefran, is in "wash-and-wear" apparel made from blends of 80% Zefran and 20% cotton or rayon.

The high melting point of Zefran with the ensuing resistance to hole melting, static control, pill resistance, appearance retention plus its natural hand and wear characteristics, make the combination of 80% Zefran with 20% cellulosic fiber an extremely functional blend. These intrinsic properties of Zefran, plus the ability of Zefran and cellulosic fibers to dye with vat, naphthol or sulfur dyestuffs in one bath with outstanding colorfastness properties, make the manufacture of "wash-and-wear" apparel appealing to many segments of the textile industry.

Formulations normally used on cotton or rayon are satisfactory for blends of Zefran and cellulosics in most cases, although precautions in the preparation of the yarn will be necessary in mills that usually use high alkaline boil-offs. Dyestuffs that exhaust at the same rate on each fiber give the best union. In very light shades, cotton usually dyes a lighter shade than Zefran with vat dyestuffs, and a better union is achieved with the addition of an agent such as Preventol GDC. Preventol GDC (2,2′-dihydroxy - 5, 5′ - dichlorodiphenyl methane) is added to the machine before the dyestuffs to retard the dyeing rate of the Zefran to approximately the dyeing rate of the cellulosic fibers.

PREPARATION OF THE YARN

The spin finish applied to Zefran during manufacture and the normal impurities found in cotton are removed by scouring with two percent anionic detergent and one percent tetrasodium pyrophosphate at 200°F for 30 minutes.

In cases where it is desirable to bleach, a sodium hypochlorite (0.3 oz/gal available chlorine) is recommended at 70 to 80°F for 60 minutes, or sodium chlorite (0.15 oz/gal) with 0.04 oz/gal nitric acid (68%) and 0.05 oz/gal oxalic acid at 120 to 190°F for 30 minutes. Normal precautions regarding ventilation and corrosion should be observed. The yarn should be rinsed and treated with sodium bisulfite (antichlor).

White effects in the yarn-dyed pattern are usually obtained by bleaching the fabric rather than the yarn. As in the case of cotton, colors that are fast to sodium hypochlorite or chlorite are used.

DYEING BLENDS OF ZEFRAN AND CELLULOSIC FIBERS WITH VAT DYESTUFFS

The formulas and methods that have been developed for cotton or rayon yarn will normally be satisfactory for blend yarn with Zefran. Several points of possible difference in procedure, to effect better unions, follow.

1) The most applicable dyeing method is to pigment the yarn with the vat dyestuff. Follow this by adding caustic and hydro to the machine slowly for reduction.

2) Careful selection of dyestuffs is recommended to achieve the best union.

3) The caustic should be held to the minimum recommended by the dyestuff manufacturer for the dye used, so as to avoid possible discoloration of the Zefran.

4) Before being added to the bath, the caustic and hydro should be dissolved together with sufficient cold water to keep the temperature from increasing and dissipating part of the hydro.

5) All of the common methods of oxidation have been used satisfactorily; however, acid oxidation, such as peroxide and acetic acid or chrome and acetic acid, is recommended for brighter shades and optimum fastness.

6) Soda ash and tetrasodium pyraphosphate may be used in soaping if needed; however, the yarn should be left neutral or slightly acid before drying.

Most packages of yarn of Zefran and cotton or rayon can be blow dried at 200°F in two or three hours. When drying Zefran, normal precautions to avoid over drying should be observed. If the blended yarn of Zefran is to be dried in an oven, the temperature should not exceed 180°F and the wet bulb should be set to keep the outside and inside of the pack from over-drying.

LIGHT SHADES WITH VAT DYES———Set the bath with an agent such as Preventol GDC in order to obtain the same shade on cotton or rayon as on Zefran when using small amounts of vat dye. One to five percent of Preventol GDC will slow the dyeing of the Zefran and allow the cellulosic fiber to dye the same shade. Two typical formulas for Zefran and cotton using Preventol are shown in Table I.

MEDIUM SHADES WITH VAT DYES———Zefran dyes at approximately the same rate as cellulosic fibers in medium shades. Regular production formulas for the cellulosic fibers usually give good unions.

HEAVY SHADES WITH VAT DYES———Temperatures from 160°F to 200°F are required to obtain heavy shades on yarn of Zefran and cotton or rayon. Two typical formulas for heavy shades on Zefran and cotton are shown in Table II.

DYEING BLENDS OF ZEFRAN AND CELLULOSIC FIBERS WITH NAPHTHOL DYESTUFFS——Good union shades on blends of Zefran and cellulosic fibers are obtained in yarn-package dyeing equipment with naphthol dyestuffs. The procedures recommended simulate those for applying naphthols to cotton.

The union is controlled by varying the temperature and the amount of sodium chloride used during naphtholation. Higher naphtholation temperatures favor Zefran while salt additions and lower temperatures assist dye build up on the cellulosic fibers.

The dyeing characteristics of blends of Zefran and cellulosic fibers (one-bath procedure) are influenced by:

1) The substantivity of the naphthol on each fiber at various temperatures.

2) The effect of sodium chloride on the distribution of naphthol between the Zefran and the cellulosic fibers at equilibrium.

In cases where the distribution of a naphthol favors the cellulosic fiber, it is possible to build up the shade on Zefran with naphthols that are nonsubstantive to cellulose, eg, CI Azoic Coupling Component 2, Azoic Coupling Component 29, etc. These naphthols are absorbed preferentially by Zefran since they are substantive to Zefran and not substantive to cellulosic fibers.

Both bases and fast color salts are used to couple naphthols applied to blends of Zefran and cellulosic fibers. The reaction between the naphthol and base or salt is considerably slower on Zefran than on cellulosic fibers; therefore, coupling times of approximately one hour are recommended. A formulation for a naphthol red on Zefran and cotton would be as shown in Table III.

PACKAGE DYEING BLENDS OF ZEFRAN AND CELLULOSIC FIBERS WITH SULFUR DYES——Union shades are obtained on blends of Zefran and cellulosic fibers with sulfur dyestuffs using comparable procedures for dyeing cotton. Both temperature and salt help to control the union. Preferential color build-up on Zefran is achieved by dyeing at high temperatures, while the addition of salt to the dyebath enhances color build-up on cellulosic fibers. Reserving agents, such as Preventol GDC, which retard dye build-up on Zefran, offer additional shade control.

When applying sulfur dyestuffs on Zefran and cotton, set the bath with one to five percent of an agent such as Hydrosulfite AWC, to stabilize the dyebath. Some of the sulfide complexes and sodium sulfide recommended by dyestuff companies to stabilize the dyebath when dyeing cotton discolor Zefran.

A formulation for a sulfur black on Zefran and cotton is shown in Table IV.

TABLE I
Typical formulas for light shades on Zefran and cotton

Light Tan				
Scour:	2.0%	anionic detergent	200°F	30 min
	1.0%	TSPP		
Overflow rinse				
Set bath:	1.0%	Nekal NF (alkylarylsulfonate with organic solvent)	140°F	10 min
	2.0%	Marasperse N (sodium lignosulfonate)		
	1.0%	Preventol GDC (2,2′-dihydroxy-5,5′-dichlorodiphenyl methane)		
Add:	1.0%	CI Vat Brown 3(dbl pst)	140°F over	10 min
	1.4%	Calcosol Fast Yellow GL Pst		
Add:	0.5%	oz/gal caustic and		
	0.5	oz/gal hydro (dissolved together)	140°F over	10 min
			Run 140°F	30 min
Overflow rinse clear to neutral pH				
Oxidize	0.1	oz/gal peroxide (35%)		
	0.1	oz/gal acetic (56%) cold to 160°F	160°F	20 min
Overflow rinse				
Soap:	1.0%	anionic detergent cold to 200°F	200°F	10 min
Overflow rinse				
Soften:	1.0 to 2.0%	cationic softener	120°F	10 min
Aqua				
Use the same procedure as recommended for the Light Tan with the following products used in specified amount:				
	5.0%	Preventol GDC		
	0.2%	Indanthrene Blue CGKWP Pdr		
	0.1%	CI Vat Green 1 (ex conc pdr)		

TABLE II
Typical formulas for heavy shades on Zefran and cotton

Navy				
Scour:	2.0%	anionic detergent	200°F	30 min
	1.0%	TSPP		
Overflow rinse				
Set bath	1.0%	Nekal NF	180°F	10 min
Add:	3.0%	Indanthrene Navy Blue BRWP Pdr (similar to CI Vat Blue 18)		
	3.0%	CI Vat Black 9	180°F	20 min
Add:	0.7	oz/gal flake caustic	180°F over	10 min
	0.7	oz/gal hydro (dissolved together)		
Run			180°F	60 min
Continuous overflow rinse clear to neutral pH				
Oxidize	0.1	oz/gal peroxide (35%)		
	0.1	oz/gal acetic acid (56%)	70°F to	160°F
			160°F	20 min
Overflow rinse				
Soap	1.0%	anionic detergent cold to 200°F	200°F	10 min
Rinse				
Soften	1.0 to 2.0%	cationic softener	120°F	10 min
Drop				
Green				
Use the same procedure as recommended for the Navy using the following dyestuffs:				
	2.0%	CI Vat Green 1 (ex conc pdr)		
	11.0%	Calcosol Fast Yellow GL Pst		

TABLE III
Typical formulation for a naphthol red on Zefran and cotton

Red				
Scour	2.0%	anionic detergent	200°F	30 min
	1.0%	TSPP		
Rinse				
Set Bath:	0.25	oz/gal flake caustic (including caustic necessary to dissolve naphthol)		
	0.50%	sodium hexametaphosphate	140°F	10 min
Add:	2.5%	CI Azoic Coupling Component 7 dissolved with caustic and alcohol	140°F	
Run			140°F	15 min
Add slowly	30.0%	common salt	140°F over	45 min
Drop bath				
Two cold salt rinse down to 50°F with 50% salt, 0.5% sodium hexametaphosphate, 0.25% flake caustic				
Couple	2.5%	CI Azoic Diazo Component 32(Base), pH 5.5 to 6.5		
	1.0%	Stabilon (a nonionic high-molecular organic condensation product)	60°F to 70°F	60 min
Cold rinse clear				
Rinse	3%	hydrochloric acid cold to	110°F	10 min
Soap	1.0%	Stabilon		
	0.5%	TSPP		
	1.0%	Igepon T-33	cold to 130°F	
		same	130 to 180°F	10 min
Soften	1.0% to 2.0%	cationic softener	120°F	10 min
Drop				

TABLE IV
Typical formulation for a sulfur black on Zefran and cotton

Black		10:1 Bath		
Scour	2.0%	anionic detergent	200°F	30 min
Overflow rinse				
Set Bath:	0.5%	sodium hexametaphosphate	90°F	10 min
	5.0%	Hydrosulfite AWC		
Add:	26.0%	CI Solubilized Sulfur Black 1	90°F	
	5.0%	CI Solubilized Sulfur Blue 7		
Heat to:			200°F	over 30 min
			200°F	15 min
Add:	15.0%	common salt	200°F	over 20 min
Add:	15.0%	common salt	200°F	over 20 min
Continuous cold rinse clear				
Oxidize	3.0%	sodium bichromate		
	1.5%	acetic (80%)	cold to 160°F	
			160°F	30 min
Overflow rinse				
Soap:	1.0%	Igepon T-33	cold to 160°F	15 min
Overflow rinse				
Soften:	1.0% to 2.0%	cationic softener	120°F	10 min

SUMMARY

Because these conventional dyeing techniques may be used to dye blends of Zefran and cellulosic fibers, new opportunities for the economical production of wash and wear fabrics are now available to the cotton and rayon industries.

TRADEMARKS

The following registered trademarks are used in this paper:

Zefran—Dow Chemical Co
Preventol—General Aniline & Film Corp
Nekal—General Aniline & Film Corp
Marasperse—Marathon Corp
Calcosol—American Cyanamid Co
Indanthrene—General Aniline & Film Corp
Stabilon—Koppers Co
Igepon—General Aniline & Film Corp

Abstracts

The Dyeing of the Newer Synthetic Fibers

Graham, J G, *Can Textile J* 75, 46-8, 51-2, Aug 8, 1958.

The author discusses the dyeing properties of the best-known fibers from each of the four important chemical fiber classes: polyamide, polyester, polyacrylic, and triacetate.

He comments that all of these fibers are dyeable with disperse dyes, and that by careful selection of these dyes, shades of very good fastness can be obtained. It must not be assumed, however, that because a particular dye is suitable for one fiber it is therefore suitable for all.

Nylon 66 (polyamide). Disperse dyes have excellent leveling power and are usually preferred for dyeing hosiery. Where better wetfastness is required, acid leveling dyes have to be used. Acid milling dyes are employed for heavy shades. Aftertreatment of acid dyes with tannic acid and tartar emetic produces still higher fastness to washing.

Nylon 6 (polyamide). Compared with nylon 66, there are few differences in the dyeing properties, but the fastness properties may vary according to the fiber source.

Terylene and *Dacron* (polyester). Disperse dyes are the most widely used, but require a higher temperature or the addition of a "carrier" to increase the rate of dyeing. The lightfastness of disperse dyes on Terylene is comparable with that on acetate, and higher than on nylon; the washing fastness is better than on either fiber. Azoic dyes are also used in certain cases (eg, for navy and black shades); the washing and lightfastness of these dyes is excellent.

Orlon (100% polyacrylonitrile). This fiber is dyeable with disperse and basic dyes, and also with acid dyes applied by the so-called "cuprous ion" process. The disperse dyes have excellent leveling properties, even in light shades, and good fastness to light and washing. For heavy shades, basic dyes are used; they build up well but require care to prevent unlevel dyeing. A retarding agent is helpful. Acid dyes have excellent fastness to light and washing, but level dyeing is difficult.

Acrilan (modified polyacrylonitrile). This fiber contains a small quantity of a basic substance which imparts some affinity for acid dyes. It is dyeable with disperse, acid, acid metallized, and chrome dyes (for heavy shades). Azoic dyes may also be applied, especially for Blacks.

Triacetate. This fiber is dyeable with disperse, azoic and vat dyes. Its dyeing properties are intermediate between acetate and Terylene. A dyeing temperature for disperse dyes of 100°C is desirable, and a carrier is recommended. The lightfastness of these dyes is comparable with that on acetate, but the washing fastness is better. Azoic dyes are used for heavy shades.

The author also refers to the "Vapocol" process for dyeing disperse dyes on Terylene, acetate and triacetate, which is described in some detail.

Suspending Action by Detergents (of Soil) in the Presence of Substrate

Harris, J C, *Textile Research J* 29, 99-118, Feb, 1959.

Even if a selected cleaning system were comprised of single-component soil, substrate, and detergent solution, and all were essentially pure, the system is far from "simple." Interactions between substrate and soil, substrate and detergent solution, soil and detergent solution, and of all three phases occur and are difficult to measure.

The present paper is concerned more with the mechanisms involved in maintaining soil in suspension (preventing deposition or redeposition) in detergent solutions than in soil removal from the substrate.

Soil suspension tests in the presence of substrate are superior to those made in its absence, but at the expense of increased complexity of the system. Among the various factors mentioned by the author as affecting the soil-substrate relationship are mechanical, chemical and electrical forces affecting both soil and substrate; adsorption of surfactant (or antiredeposition agent) on substrate and/or soil; sedimentation; deflocculation; soil-particle size; solvation; and several others of lesser potential.

Surfactants are improved in soil-deposition prevention by added builders such as polyphosphates and silicates, particularly when calcium ion is suppressed. Outstanding in preventing carbon soil deposition are nonionic surfactants.

Interpretation of various mechanisms proposed for the action of sodium carboxymethyl cellulose (NaCMC) in preventing deposition indicates probable action by adsorption on the cellulose substrate. Data of equal persuasiveness for similar action by surfactants are lacking.

It has been suggested that the effectiveness of NaCMC in preventing soil deposition may be attributed to hydrogen bonding of the fiber-NaCMC complex, or that a unique

(*continued on page 65*)

CENTRAL NOTATIONS FOR COLOR-NAME BLOCKS

Central notations were determined for the Inter-Society Color Council—National Bureau of Standards color-name blocks in a recent color-measurement study at the Bureau. From these notations, sample colors are being produced on 6″x12″ paper sheets. If the samples are found to be representative of the color names assigned to the blocks, it is planned that the colors will eventually be reproduced as a color-chart supplement to NBS Circular 553. This circular is a hard-bound volume titled "The ISCC-NBS Method of Designating Colors and A Dictionary of Color Names." It is published by the U S Government Printing Office, and is available for purchase by the general public.

IN a color-measurement study by Kenneth L Kelly of the National Bureau of Standards, central notations have been determined for the ISCC-NBS color-name blocks (*1*). These blocks are defined as segments of a solid figure, each segment encompassing the range of color acceptable under one color name. Fitted together, the segments comprise the psychological color solid that scientists use to explain gradations in color perceived by the human eye.

The central notations of the blocks have been designated in terms of the Munsell tridimensional scales (*2*), and paint-on-paper prototypes of the centroid color of each block are being produced. After the prototypes have been approved by the ISCC (Inter-Society Color Council) and NBS, the Bureau plans eventually to reproduce the colors as a color-chart supplement to NBS Circular 553, "The ISCC-NBS Method of Designating Colors and A Dictionary of Color Names" (*3*).

First published three years ago, Circular 553 is now in its third printing. It is employed as a tool by the scientist, the businessman, and the layman to correlate the thousands of different names given to colors by art, science, and technology. These color names are listed in the circular under headings derived from the color-name blocks. The varied applications to which the circular has been adapted by the general public have created a need for a color chart to illustrate the blocks. The present study was therefore made to determine the block centroids from which representative color samples could be produced.

In making the computations, the ISCC-NBS method of designating colors was followed. In this method, the psychological color solid is visualized as a lopsided grapefruit with an irregularly indented outer skin. Its vertical core is white at the top, black at the bottom, with the intermediate grays in between. The characteristic of color varying along this vertical axis is known as *lightness;* it indicates how dark or light the color is, and is measured by Munsell *value*.

The second characteristic of color is known as *hue*. Hue is indicated by the name given to a color, such as red, yellow, green, or blue. These four spectrum hues, plus the nonspectrum hue, purple, are thought of as evenly spaced around the equator of the grapefruit in accord with the Munsell hue scale. Elsewhere in the solid are places for all the possible colors; light ones near the top; dark ones near the bottom; and the grayish colors surrounding the grays at the core.

Saturation, the third characteristic of color, indicates the departure of a color from gray. This quality is measured by Munsell *chroma*, which gives the distance of the color location in the solid from the core. The most saturated or strongest colors are located on the skin. Those with little saturation, such as purplish black, purplish gray, or purplish white, lie along the core or vertical axis.

In the ISCC-NBS method of designating colors, a set of simple, unambiguous hue names is utilized. They are combined with modifiers to form combinations such as light blue, dark red, moderate yellow green, and vivid pink. The complete set of color names including white, the grays, and black totals 267, and the names may be used to describe any color.

The color-name blocks are not cubes; the inner blocks are composed of sectors of cylinders. It was therefore necessary to use a mathematical formula in terms of Munsell *hue*, *value*, and *chroma* to determine the numerical designations of the centroids. With the formula, the centroid of a single or one-component block could be calculated from its hue, value, and chroma ranges. However, to find the centroid of a compound or two-component block, the volume-weighted mean of the central notations of the two components had to be computed. The resultant centroid lies on the straight line joining the centroids of the component blocks.

For a three-component block, the centroid for two of the adjacent blocks was found, and then combined by the same method with the centroid of the third block. The value notation of the resultant centroid was computed as the volume-weighted mean of the value notations of the three separate centroids. The formula is not applicable to color-name blocks that intersect the irregular outer surface or skin of the color solid. For these blocks the centroid was estimated graphically.

When the centroid color samples become available they will be made into special charts for the use of a committee of the Inter-Society Color Council, which is investigating historical color usage. The centroid colors may ultimately be incorporated as an appendix in a second edition of NBS Circular 553.

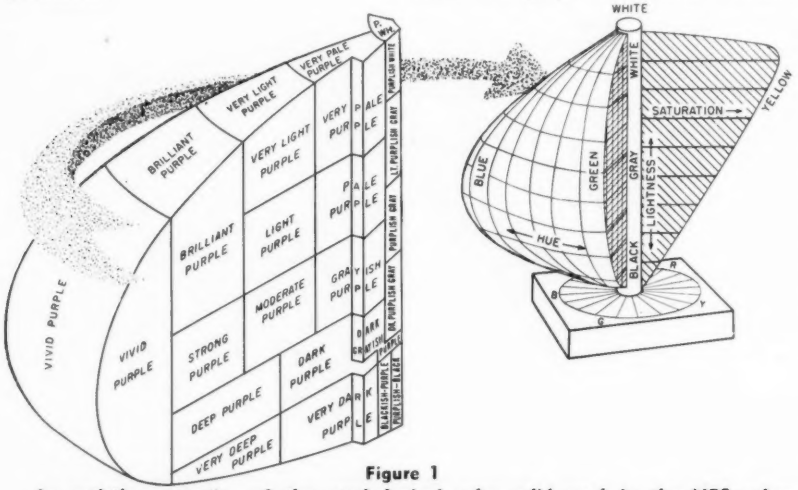

Figure 1

An artist's conception of the psychological color solid used in the NBS color-measurement study. One quarter of the solid is removed to show the vertical axis. On the left is pictured a segment of the solid from the purple area. Its color-name blocks reflect varying degrees of hue, lightness, and saturation.

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(3) "Dictionary of Color Names", NBS Tech News Bull **40**, 22 (1956). NBS Circular 553 is available from the superintendent of documents, U S Government Printing Office, Washington 25, DC, for $2.00 ($2.50 foreign).

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American Association of Textile Chemists and Colorists

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May 18, 1959

Delaware Valley Section———

REACTIVE DYESTUFFS*

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INTRODUCTION

SEVERAL papers pertaining to reactive dyestuffs have been read or published over the past two years. They have covered all phases, from the chemical aspects to the application. It is, therefore, difficult to speak on this subject without partially repeating what you have already heard or read.

Just what impact this new type of dye will have in the future is pure conjecture. The spontaneous reaction in the printing field was partly due to the exceptional brightness which designers were craving. In dyeing, the first demand, again, was brightness, which is found in the Turquoise Blue; although there, in addition to brightness, washfastness and ease of application played important roles.

Reactive dyes are now being applied successfully on cellulose by pad-steam, pad-roll, thermofixation and on the jig. They are not recommended for heavy shades on the dyebeck because of the excess chemicals required in the long liquor ratio. Package, beam and stock dyeing are ever increasing. Work on rayon cakes show great promise; also the dyeing of rayon skeins appears to be no problem.

There is one important factor the dyer must be cognizant of. That is, a thorough washing after dyeing is necessary to obtain the best fastness to water bleeding and washing. This can be accomplished with hot rinses and boiling soaping with a nonionic detergent. Also soaping after resin treatment is essential to maintain maximum lightfastness. The application of resins is covered in a paper presented by Glarum (*1*) at the 37th National Convention of AATCC.

* Presented before the Delaware Valley Section on December 5, 1958.

APPLICATION METHODS FOR CELLULOSE

The application of reactive dyes is practical with present plant equipment as shown by the following procedures.

PAD-STEAM———The most convenient method is the pad-steam procedure, which is continuous. The procedure is to pad the dyestuff and dry. Care must be exercised to prevent migration of dyestuff during this drying operation. This is followed by a second padding through a cold chemical bath containing two pounds, five ounces to two pounds, 10 ounces of common salt, and 1.6 ounces to 2.75 ounces of caustic soda per gallon of pad liquor. Steaming at 220-225°F requires 30 to 90 seconds. Usually, 60 seconds are sufficient, the exception being heavy shades. The eight boxes after the steamer are used for hot rinsing, soaping and the finish.

THERMOFIX———The thermofix method, while not a continuous process, is not very efficient for plants not having pad-steam equipment. This process consists of padding, drying, curing, and the subsequent rinsing and soaping. The pad liquor contains dyestuff, urea, and soda ash, used as the alkali. The alkali should be added at or below 140° F, and padding carried out at this temperature. As with the pad-steam method, care must be exercised in drying. For this purpose, the hot-flue dryer is best, although drying can be carried out on dry cans, provided the first set is wrapped. Fixation is accomplished by curing at 280-340° F, from one and one-half to five minutes, depending on the temperature. Finishing is the same as for the pad-steam procedure.

JIG———The dyes can also be applied on the jig. An enclosed jig is necessary to obtain the required temperature for fixation of Cibacron Turquoise Blue G. One may also pad first, then use a saturated salt solution with alkali in the jig for fixation. The short liquor ratio in the jig is a handicap in rinsing and soaping, although with continuous overflowing rinses, satisfactory results may be obtained.

PACKAGE AND BEAM———During the past year, the application of reactive dyes on package and beam has made considerable progress. The dyer handles their application on mercerized packages with the same confidence as with vats and naphthols. The bright Turquoise Blue found a ready market on both mercerized and plain cotton, due to the ease of application. A full range of shades is now offered to the weaving and knitting trades. Brightness, while desired in many patterns, is not the essential reason for the change to reactive dyes. The better wash- and lightfastness of the reactive dyes compared with aftertreated direct and developed colors, plus the shorter dyeing cycle, make the former very attractive. These dyes are ideally suited for production of pinks, tans, greys and slates on mercerized yarn. A sequestering agent and a mild oxidizing agent are recommended to be used in the dyebath. A good grade of common salt, such as TNA5 or 999, should be used. The amount varies from four to 12 ounces per gallon dye liquor, based on the depth of shade.

Unlike with the pad-steam and thermofix processes, the dyer has a choice of alkali. A pH range from 10.0 to 11.2 is required, depending upon depth of shade and dyestuff

used. This range can be obtained by using:

3-4 oz/gal soda ash, or
3-4 oz/gal trisodium phosphate, or
3 oz/gal soda ash plus
10-20 g/gal caustic soda.

The amount of alkali, like the common salt, must be based on volume, not on weight of material. Trisodium phosphate should not be used, even with a sequestering agent, if there is excessive hardness in the water.

A dyeing temperature of 175°F is recommended, except where Cibacron Turquoise Blue G is used. This color should be dyed at 200°F, at which temperature full color yield will be obtained in the normal time cycle. When this color is used in combinations, it is advantageous to use a 175°-190°F dyeing temperature, depending upon the amount of Turquoise in the shade, and, if necessary, prolong the dyeing cycle. This will give better control of the shading colors, and full color yield of the Turquoise may be obtained. Here again, it is necessary to give thorough rinsing and soaping to obtain maximum washfastness. Soaping at 200°F with nonionic detergent is best.

Cibacron reactive dyes can be applied to viscose cakes, skeins and also stock. In cake dyeing, it is necessary to use a one-way flow, inside-out. Also, the first addition of salt should be very small, and the portions gradually increased over a prolonged period. The minimum salting time should be at least one hour. Here is a cake dyed with Cibacron Black BG. It is evenly dyed and has excellent light- and washfastness. The knittings show the evenness that can be obtained when dyeing with Cibacrons on 300-denier viscose.

The Smith-Drum Cascade-type skein machine is ideally suited for the application of reactive dyes to rayon skeins. The same procedure used for package dyeing works well on skeins. The level dyeing properties of reactive dyes make them very practical for dyeing stock.

Here we have samples of rayon stock used in the carpet trade. They happen to be pastel shades which were dyed in the same time cycle as direct colors. In this case only a hot rinse was used to remove the electrolytes.

APPLICATION METHODS ON WOOL

As a result of research and development conducted in our laboratories, we are now able to dye wool on stock, yarn and piece goods with the Cibacron dyes. Excellent color yield is obtained on wool, even when the dye is applied in the long liquor ratio usually found in beck dyeing. Bright reds and scarlets were the only shades of interest to be dyed with the reactive colors. Cibacron Scarlet 2G, Cibacron Brilliant Red 3B, using Cibacron Blue 3G for shading, are recommended. Cibacron Brilliant Red B is a welcome addition to the reactive range, for cellulose as well as for wool. This new color allows the dyer to use less Scarlet 2G where solubility may be somewhat of a problem.

The red shades produced on wool show excellent lightfastness. Fastness to Florida sunlight and weathering are second to none. This is shown in samples dyed the flag red shade with acid dyes, premetalized dyes and the Cibacrons. Originally, there was some difficulty with perspiration fastness; this has now been corrected with a change in dyeing procedure. Wet and dry crockfastness are equivalent to the bright reds presently on the market. A procedure for producing a bright red serge material is as follows:

Prepare the material as usual.
Set dyebath at 170°F with
1.00% Neovadine AN (a nonionic compound)
2.50% acetic acid (56%)
pH 5.0.
Run 10-15 minutes.
Add:
3.200% Cibacron Scarlet 2G
0.800% Cibacron Brilliant Red 3B
0.013% Cibacron Blue 3G.
Run 10 minutes at 170° F.
Raise to boil in 30 minutes.
Boil 45 minutes.
Add:
4.000% acetic acid (56%)
pH 4-5.
Boil 30 minutes.
Sample.
Additions of dye are made at 180°F.
Shut off steam.
Add: 2.5% hexamethylene tetramine
Boil 20 minutes pH 7.0.
Rinse.
Refill at 70°F.
Run 10 minutes with 2.0% formic acid.

It is possible to substitute ammonia for hexamethylene tetramine. The amount of ammonia to be used should be equivalent to the amount of acetic acid (56%) used in the dyeing. Ammonia should be applied in a cooling bath for 20 minutes.

Examination of the fabric will show a good level dyeing with a #7 light rating. This skein (wool yarn) with a very high twist was dyed by a similar method. The package and stock sample are representative of what may be obtained in this field.

Here is a sample from a bulk dyeing of a blend composed of 55% wool and 45% Dacron. A two-dyebath method was used to produce this shade. The Dacron was dyed first with a carrier using acetate colors, scoured; then the wool was dyed with Cibacrons. Perspiration and crock tests were very good. This was exposed for 100 hours in the Fade-O-meter before a break.

The production of bright blues and greens on wool with any degree of lightfastness has been impossible. We have had to rely on CI Acid Blue 1 and CI Acid Green 16 for these shades. Everyone is aware of their poor lightfastness. A new line of reactive dyes, "tailored" for wool only, is now a reality. These will be known to the trade as Cibacrolans. The first two of this new series are Cibacrolan Blue 8G and Cibacrolan Green VM, which have distinctly superior lightfastness and brightness, and excellent all-around fastness. It is also possible to use Cibacron Brilliant Yellow 3G with the above dyestuffs for production of very yellow greens. The dyeing procedure for pastel and medium shades, which follows, varies somewhat from the application of Cibacrons on wool.

Prepare material as usual.
Set dyebath at 120°F.
Add:
0.70% Neovadine AN
5.00-6.00% ammonium acetate.
Run 10 minutes at 120°F.
Add:
dissolved dyestuff.
Run 10 minutes at 120°F.
Raise to boil over 20 minutes.
Boil one hour.
Drain.
Set fresh bath with:
3.00% ammonia.
Raise to boil.
Boil 20 minutes.
Rinse.
Refill at 70°F.
Add:
2.00% formic acid.
Run 10 minutes.
Drain.

APPLICATION METHODS FOR COTTON AND DACRON BLENDS

One of the newest applications is the dyeing of cotton and Dacron blends with Cibacrons and Cibacete

(*concluded on page 50*)

37th National Convention———

RECENT ADVANCES IN THE DYEING OF ACRILAN ACRYLIC FIBER*

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The Chemstrand Corp
Decatur, Ala

Each acrylic fiber is dependent for its dyeing behavior upon fiber composition. For this reason, it is important that full consideration be given to the methods outlined for the dyeing of each acrylic-type fiber. By far the greater proportion of trouble experienced in the dyeing of Acrilan has resulted from dyer's ignoring the instructions given and resorting to methods used for the dyeing of other acrylic fibers.

Dyeing methods recommended for Acrilan are controlled in the main by the anionic dye receptor contained in the fiber. This again emphasizes the need for following the recommended Acrilan methods carefully, if the best results are to be obtained.

The dyeing of Acrilan with basic dyes is pH dependent. Although ammonium acetate has given good results in the past as a dyeing assistant, it has been found that urea gives much improved results. Through the use of urea, by far the largest majority of basic dyes available on the market give improved color build-up and dye at a controlled rate. It has been found that urea can be used to control the rate of dyeing. Increased concentrations of urea bring about increased rates of dye absorption. Through the use of urea as a rate-controlling tool, the dyer has the privilege of modifying his dyeing rate to suit the requirements of his equipment.

Not only does urea improve the dyeing picture of Acrilan as far as basic or cationic dyes are concerned, but it also proves very effective as a print paste additive. Through the addition of urea to Acrilan print paste, prints of very high color value can be obtained with basic dyes. Through the application of urea in print paste, it is now possible to obtain light to full shades in neutral print pastes steamed under atmospheric conditions.

INTRODUCTION

THE MAN-MADE fiber industry continues to expand. Too few of us realize how rapidly it is growing. Progress in this field is electric. Each day opens possibilities for new fiber concepts. The availability of new developments in polymer chemistry leading to new and/or cheaper intermediates all add to the development potential. Couple this with the intensified research efforts of fiber manufacturers already established in the industry, as well as the promise of those just embarking, and you have a rather dynamic future for the man-made fiber industry. Typical of the development in the man-made fiber areas is the comparison between the 1954 edition of "Artificial Fibers" by R W Moncrieff *(1)* and the 1957 edition of his book, which he renamed "Man-Made Fibers" *(2)*. In the 1954 edition, he shows approximately sixty fibers of which three are acrylics. Only three years later, he lists close to four hundred fibers and over ten acrylics.

With the promise of increased activity in the new fiber industry, we can expect each chemical class of fibers to grow. Already, the family of acrylic fibers has expanded to a level where we must give it very serious consideration. With the possibilities of so many fiber blends and the increased problems sponsored by such promotional developments as "wash and wear," the dyer's future takes on nightmare proportions. The need for organizing his knowledge becomes obvious.

This need for organization becomes all the more obvious if you consider how our knowledge of dyeing new fibers will grow. Will we develop new and entirely different methods of dyeing or will we follow the course so sagely suggested by Wilson *(3)* in his discussion on the impact of man-made fibers upon the dyeing industry? Mr Wilson's words are worth repeating. He said, "It would seem that, to meet the growing complexity of textile fabrics, we cannot expect to discover a series of revolutionary dyeing methods. That is to say the basic processes in use for natural fibers and the older man-made fibers are still with us and will remain so. There will be inventions; but, for the most part, we shall require a large number of refinements of dyeing processes, each of which may be small but which in the aggregate will represent considerable advances."

The last sentence of Mr Wilson's comments is worth further consideration, for it is in the small differences in technique that we must look for the key to improved performance. This means that each method suggested for the different fibers must be carefully considered. Any attempt to generalize the acrylic dyeing picture, for example, and ignore the small differences in dyeing behavior of the individual members of the group will lead to needless dyeing problems. We have found that by far the greatest percentage of the troubles realized in the dyeing of Acrilan has stemmed from attempts to make it dye precisely as other acrylic fibers on the market. Admittedly, the temptation to yield to the fallacy that all acrylics should be dyed by the same method is very great, but nothing can complicate the dyer's picture so quickly.

DISCUSSION

Each acrylic fiber, by reason of its composition, has its own dyeing requirements and dyes best with those dyes and conditions carefully selected for their performance on the specific fiber in question. Let us briefly look at some of the differences among acrylic fibers and see how they affect dyeing behavior.

A fiber of 100% polyacrylonitrile is difficult to dye. It has no specific chemical groups with strong affinity for dyes and its dense cohesive structure hinders the diffusion of dyes into the fiber. Dyeability has been improved by opening up the fiber to facilitate diffusion and also by the addition of dye receptors having affinity for anionic dyes, such as the acid and direct colors. Compounds such as vinyl acetate, methyl acrylate, methyl methacrylate, etc in themselves have little or no affinity for dyes but, by decreasing the compactness of the structure of the acrylonitrile chains, they allow dyes to diffuse more readily. As the fiber is opened up, dyes may penetrate more quickly, allowing more dye to be absorbed in a normal dyeing time. The second type of additive furnishes specific dye sites capable of forming a strong chemical bond with anionic dyes.

Much has been written about the type and class of compounds incorporated in acrylic fibers to impart anionic dye acceptance. Kramrisch *(4)* lists a

* Presented October 30, 1958 during the 37th National Convention at the Conrad Hilton Hotel, Chicago, Ill.

wide range of basic compounds which may be used to supply dye sites for anionic dye absorption. The choice of a suitable dye receptor is not a simple matter. It involves not only considerations related to polymer composition and spinning processes, but also the whole dyeability picture. This is a fact too often ignored by dyer and dyestuff technician alike. It is only to be expected that, if a basic material is added to a fiber, it must reflect itself in the surface charge of the fiber produced and, of course, play a very important part in the absorption of both anionic and cationic dyes. We can therefore expect each modified acrylic fiber to exhibit dyeing behavior governed by the anionic-dye receptor and its effect on the electro-chemical properties of the fiber.

Although the differences in dyeing behavior of the two general classes of acrylic fibers (those modified with dye receptors and those not) cannot be wholly accounted for by the presence of anionic dye receptors, they play a more important role than most of us realize. The marked difference between modified and unmodified acrylic fibers in their behavior towards dye can, in part, be traced to them. Their effect is again noticed in the dyeing performance of the individual members of the modified acrylic fibers with both basic and acid dyes. Acrilan absorbs cationic dyes much more slowly than Orlon-42, which must make use of a dyeing retarder to control dyeing rate.

The response of Zefran and Creslan (both modified acrylics) to basic dyes is much less than Acrilan and their up-take of anionic dyes varies widely. The differences in the dyeing behavior of the individual members of the acrylic fiber group are as great as those found in the natural fibers. They bear no more resemblance to one another than wool and silk do toward nylon. For this reason, it is important to consider each member as a separate entity if we are to exploit its dyeability to the full.

Acrilan's behavior towards anionic dyes is better understood when we consider Lister's curve (5) illustrating the absorption of acid by Acrilan. (See Figure 1). From this curve, it is evident that the absorption of acid by Acrilan is pH dependent and reaches a maximum at around a pH of 2.0. Under these conditions of acidity, we know that the anionic dye receptor becomes appreciably ionized and maximum anionic dye absorption is realized. Acid absorption can and does take place at higher pH levels, but to a lesser degree. Recent research indicates that full penetration and maximum fastness may be obtained at higher pH levels by modification of the dyeing method; however, at the time of writing, these experiments were far from complete.

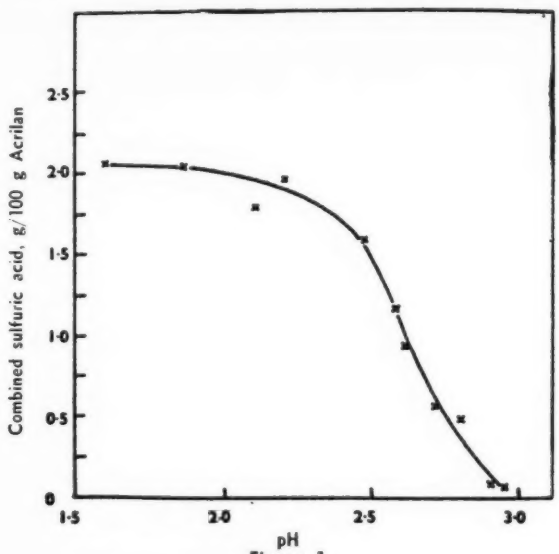

Figure 1
Acid-combining capacity of Acrilan at 60°C
(according to Lister)

TABLE I
Dyebath exhaust as function of pH

1% Dye	pH5	pH6	pH7	pH8
Sevron Yellow 3RL	60	70	80	80
Genacryl Orange R	95	95	95	100
Deorlene Brill Red 3B	45	65	75	—
CI Basic Violet 14	40	45	45	45
Sevron Red GL	50	60	70	80
CI Basic Blue 21	65	75	85	90

Acrilan, like wool, is amphoteric and has both basic and acidic groups; but, unlike wool, possesses a strong affinity for basic dyes. Recent work has shown that the absorption of basic dyes by Acrilan is, in large part, also pH dependent and logically, it lies in the opposite direction. Whereas Acrilan's affinity for acid dyes increases as the pH is lowered, its absorption of basic dyes appears to increase with increasing pH, with an upper limit of around pH 8.

The first recommendations made covering the dyeing of Acrilan with basic dyes called for the use of ammonium acetate. Ammonium acetate was chosen as the most simple dyehouse chemical which would give the pH spread necessary to obtain the maximum color value for the largest number of those basic dyes available at the time. Under this method, a uniform rate of dye absorption was realized; however, the color build-up was only adequate for medium to medium-heavy shades. This did not present any problem, as the heavy shades could be readily obtained either through the use of wool dyestuffs or the combination of acetate and basic dyes. With the increase in the development of cationic dyes, studies were implemented to re-evaluate Acrilan's position with this important class of dyes and to develop improved dyeing techniques.

Using simple buffers, the exhaustion of a series of 1% dyeings of several basic dyes were compared at pH 5, 6, 7 and 8. These results are shown in Table I.

From the results shown, it is obvious that it would be difficult to get maximum color yield of all dyes by selecting one pH value. In theory, what was needed was a single compound which would cover a pH range from 5.5 to 7.5. Ammonium acetate was chosen as the most familiar dyehouse chemical capable of giving this approximate pH range. In actual practice, maximum color pick-up was not realized with this compound. It was found that most dyehouses pasted cationic dyes with acetic acid to assist in dissolving the color, despite the excellent solubility of most of the newer cationic dyes. This made the bath too acidic for optimum color build-up of basic dyes on Acrilan. The use of methanol in place of acetic acid in pasting the dyes gave a decided improvement in color yield with many colors, but it was still not enough. The reason for this is that many of the basic dyes themselves are quite acidic. Urea, on the other hand, gave promise of improved performance.

With the use of urea, the pH of the dyebath rose steadily from 5.5 to over 7 in the course of a normal dyeing period. As each dye in turn was passed through the pH of maximum absorption as dyeing progressed, very real improvements in dye uptake could be realized. As a general statement, the increase in color value

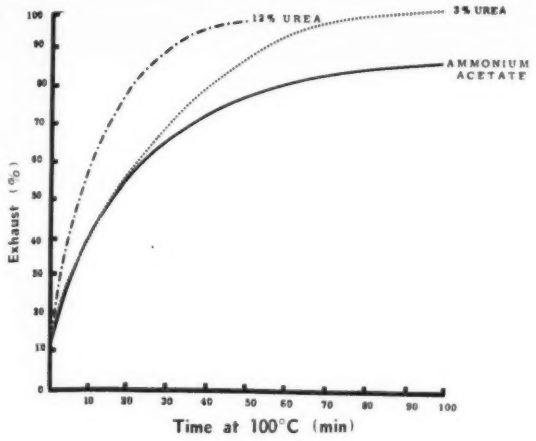

Figure 2
1% Sevron Yellow 3RL

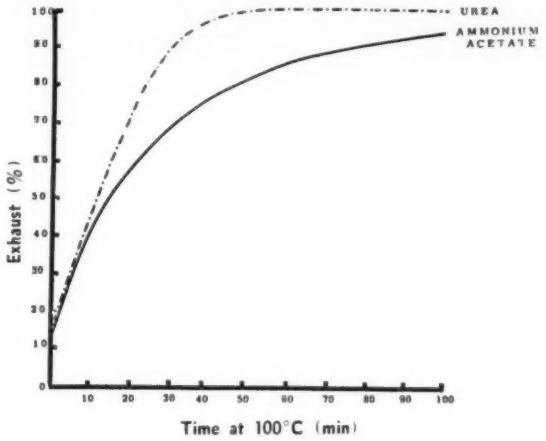

Figure 3
1% Astrazon Yellow 7GLL

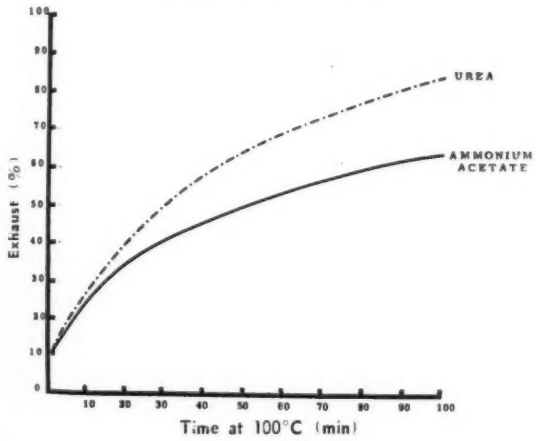

Figure 4
2% Sevron Red L

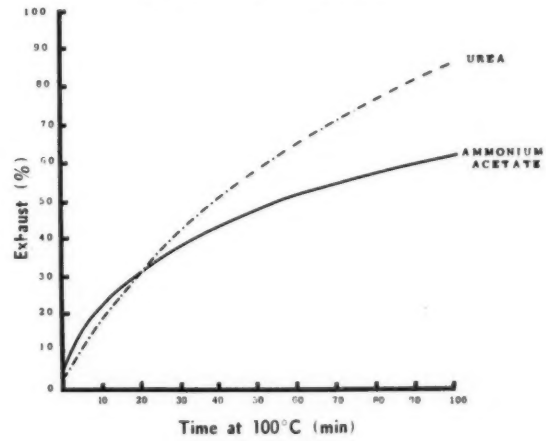

Figure 5
2% Sevron Red GL

using the urea technique amounted to roughly 30-40% over that which had been obtained using the ammonium acetate method. Although a few dyes did not respond to urea, by far the largest proportion of the forty-some-odd dyes tested showed a significant increase in strength because of its use. As a further extension of the basic dye studies, auxiliary products were screened for their suitability for the proposed dye method. Color build-up and fastness were checked on a range of dyeings made with 3% urea and 0.5 to 1% of a number of dyeing assistants. Anionic materials were eliminated because of precipitation despite the singular success of Igepon T in earlier work. Cationic products exhibited a retarding effect and were also put aside. This left nonionic products, some of which contributed to improved color build-up and, at the same time, had no effect on the fastness properties of the final dyeing. As a result of this work, a series of dyeings were made in our own dyehouse and in the trade using the following method:

Dyestuff
3.0% Urea
0.5% Igepal CO 710
Enter at 120°F—run 10 minutes.
Raise to the boil in 45 minutes.
*Boil 60 minutes—patch.

Using this method, customers reported savings in time, dyes and chemicals and improved fastness properties. The savings in chemicals amounted to around $1.80 per 100 lbs; and over a wide range of shades, savings in dyestuff costs ran from 20 to 40% of the ammonium acetate method. Besides material costs, there was a significant saving in time, often resulting in a reduction of the total time required by one third. A review of the fastness of the resultant dyeings showed them to be one-half to one grade better in lightfastness and with slight improvements in AATCC wash test II.

When Acrilan/rayon blends were dyed, the stain on the basic dyes was significantly reduced as was the dyeing time. In the past, Acrilan/rayon was dyed by first dyeing the Acrilan with basic dyes using ammonium acetate, then neutralizing the bath, adding the direct colors and salting them on in the cooling bath. With the use of urea, the neutralization step could be eliminated, which, when coupled with the faster dyeing of the Acrilan with the basic dyes, constituted a significant saving in time. Because of the decreased staining of the rayon by the basic dyes, improved fastness to washing and light were realized in many shades.

In the practical application of the new method, there were many questions which needed answering before the principle of the urea method could be accepted. As many shades on Acrilan can be produced more cheaply with mixtures of disperse and basic dyes than by the use of

* It is mandatory that temperatures of 205° F and over be used in the dyeing of Acrilan to realize maximum color build-up and fastness properties.

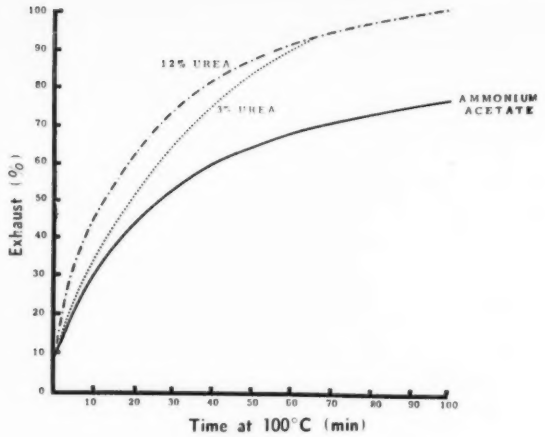

Figure 6
2% CI Basic Blue 22

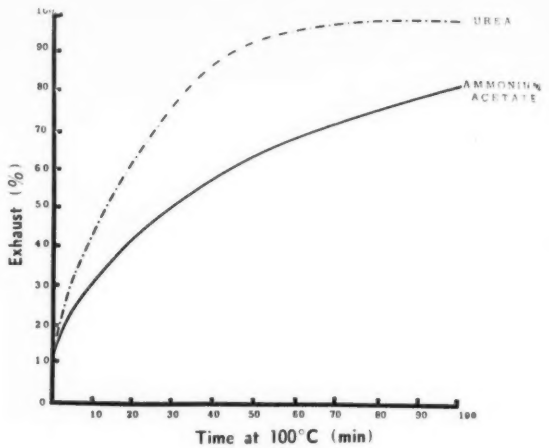

Figure 7
2% CI Basic Blue 21

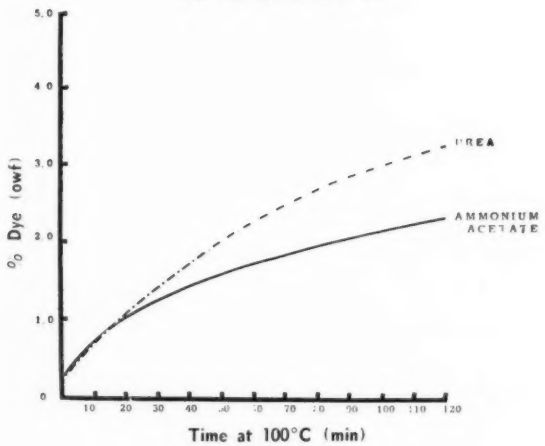

Figure 8
5% Sevron Yellow 3RL

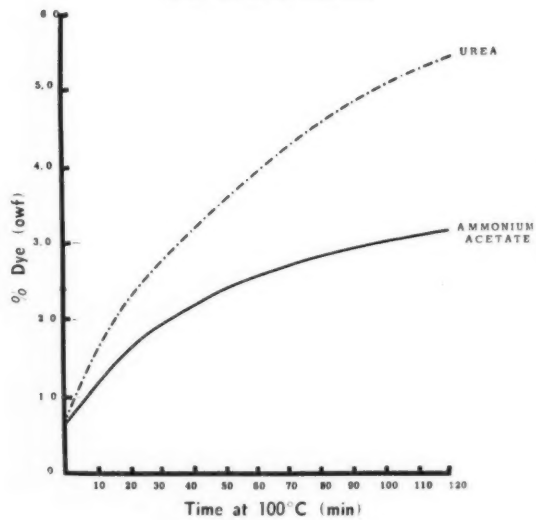

Figure 9
10% CI Basic Blue 21

either class of dyes alone, it was of interest to see what effect the urea method had on the dyeing behavior of disperse dyes. Those disperse dyes recommended for dyeing Acrilan were dyed by the urea method and compared with a control set dyed by the standard method suggested in the "Acrilan Dyeing and Finishing Manual." The color yield by both methods was the same; however, the results of the No. II wash tests showed the dyeings made by the urea method to be slightly better in the degree of staining of the multifiber test cloth.

The performance of the method in closed machines was checked on both stock and yarn and the results showed excellent agreement with beck dyeings. The possible effect on additions to the exhausted bath was checked and no signs of trouble existed in this area.

To show the effect of urea on the rate of dyeing and to compare it with that of dyeings made with ammonium acetate, a series of dyeings was made in the dyeometer at a constant temperature of 100°C for a period of two hours. Percent exhaust was plotted against time for a series of basic dyes in varying concentrations. These are shown in Figures 2 through 7.

From these curves, it is obvious that urea increases the pick-up of basic dye, resulting in higher color yield. Figure 2, showing the effect of 3 and 12% urea against 3% ammonium acetate, illustrates the increase in dyeing rate possible with an increase in urea concentration with 1% Sevron Yellow 3RL. A comparison between Figure 2 and Figure 6 covering CI Basic Blue 22 suggests that the percentage increase in rate will vary for each dye. As a general statement, it would appear that, with urea, an equivalent depth to that obtained with ammonium acetate can be reached in 40 to 50% of the time required by the older method. In most cases, the urea curve indicates a continuation of color build-up with time; whereas the ammonium acetate curves flatten out, and on prolonged boiling very little color build-up is realized. The effect of urea on color build up and rate is more noticeable in heavy shades. The three graphs shown in Figures 8, 9 and 10 illustrate this very clearly. High concentration dyeings of Sevron Yellow 3RL, CI Basic Blue 21 and CI Basic Blue 22 were made in the dyeometer using 12% urea in one series and 3% ammonium acetate in the other at 100°C for two hours; percent dye on the weight of the fiber was then plotted against time.

The increase in rate is again obvious when urea is used and the shape of the curves again suggests that, with urea, dye absorption will continue; whereas, in the case of

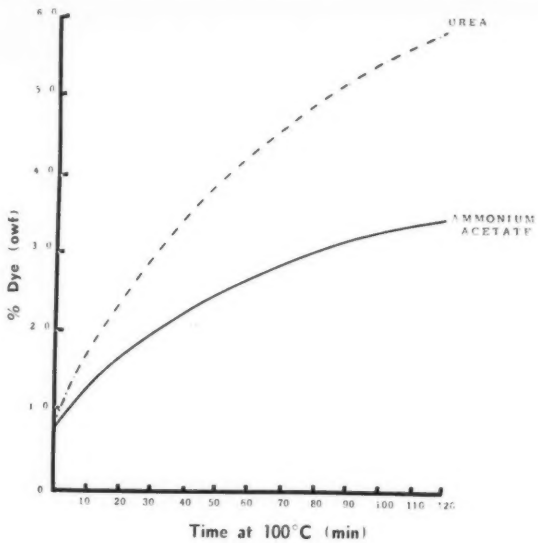

Figure 10
10% CI Basic Blue 22

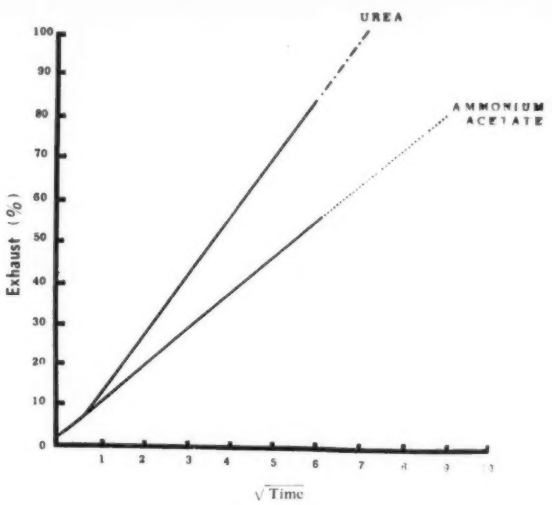

Figure 11
2% CI Basic Blue 21

ammonium acetate, there is a distinct leveling off at the two-hour period.

To obtain an approximation of the relative dyeing rate of those dyes tested, the data was replotted (Figure 11) showing percent exhaust vs square root of time and dyeing rates calculated by the method of Speakman and Smith using:

$C_t = k\sqrt{Dt}$ $\quad C_t$ = % dye on fiber at time t

$S = C_t/\sqrt{t} = k\sqrt{D}$ $\quad t$ = dyeing time

$\left(\frac{S_1}{S_2}\right)^2 = \frac{D_1}{D_2}$ $\quad D$ = dyeing rate

where the relative rates are proportional to the square of the slope of the straight line plot obtained.

When the data is handled in this manner, the approximate increase in dyeing rates over the ammonium acetate method is readily seen. Table II lists the increase in dyeing rates for those dyes checked.

The differences between the values for CI Basic Blue 21 and Sevron Yellow 3RL in the light and heavy concentrations can be accounted for in two ways. One is the fact that some dyes respond to urea more than others. The other lies in the different dyestuff concentrations used for the above two dyes. At low concentrations, the dye is absorbed readily under both sets of conditions. As the dyestuff concentration increases, the effect of urea becomes more apparent.

Despite the fact that this study is not completed, it is obvious that not only can the use of urea increase the basic dye pick-up of Acrilan, but, through increasing dyeing rate, can shorten dyeing times. The differences in the rate of dyeing between concentrations of 3 and 12% urea would suggest that rate might be controlled by urea concentration. This, together with the other advantages accrued through its use, makes urea a logical choice as a dyebath additive in the dyeing of Acrilan with basic dyes.

TABLE II

% Dye	Increase in dyeing rate (%)
1% Astrazon Yellow 7GLL	82
1% Sevron Yellow 3RL	89
2% Sevron Red L	57
2% Sevron Red GL	186
2% CI Basic Blue 22	102
2% CI Basic Blue 21	160
5% Sevron Yellow 3RL	235
10% CI Basic Blue 21	242

The success of the basic or cationic dye methods using urea led to the consideration of urea in the printing of Acrilan. Simple pastes involving color thickener and urea gave excellent bright, clear prints on Acrilan with atmospheric steaming. Dyes are mixed with the urea and then dissolved with the addition of hot water and then incorporated with the required thickener; printed, dried and steamed for 45 to 90 minutes with 1-2 psig; then washed and dried. The fixation of color is excellent and the loss of color in the final washing operation is very slight.

The fastness of the resulting prints is excellent, and a full, bright shade range can be produced. A typical print formula will contain three to four parts of urea, gum tragacanth, crystal gum, textile gum or any other suitable thickener. It should be mentioned here that, under no circumstances, should acid be used in a basic or cationic print paste for Acrilan, as the color yield will be very poor.

CONCLUSION

Through the use of urea, Acrilan's dyeability picture continues to improve. With a full range of shades possible with both disperse and basic dyes, as well as a complete coverage of those dyes used for wool, Acrilan and its blends can be dyed very readily. As mentioned previously, work is continuing in the development of improved methods for dyeing with acid dyes using reduced amounts of acid. The increased naphthol range is also being investigated to expand its usefulness. At the present time, the use of naphthol blacks is widespread with shades of excellent fastness being produced at a very low cost. Vat dyes and vat esters have already been used with real success; however, improvements in method and dye selection show promise of increased activity in this area.

ACKNOWLEDGMENT

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Niagara Frontier Section———

USE OF POLYETHYLENE EMULSIONS IN TEXTILE APPLICATIONS*

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Polyethylene emulsions can be formulated in nonionic, anionic, or cationic systems. The nonionic emulsions are most widely used because they are compatible with most finishing bath ingredients and do not yellow, change dye shade or retain chlorine. Tests of unblended natural and man-made fabrics show a high increase in tear strength with extremely small amounts of deposited polyethylene. In blended fabrics, the flex abrasion and tear strength are improved. In conjunction with thermosetting resins, the polyethylene gives higher crease resistance improvements over that imparted by the resin alone, and minimizes reduction in tear strength and flex abrasion. The polyethylene has no effect on the loss of strength on chlorine bleaching. Polyethylene has been found to be present in the fabric after twenty launderings. In all cases, the polyethylene improved the hand and, if properly formulated, should cause no scorching problems.

INTRODUCTION

POLYETHYLENE emulsions have been used for only a comparatively short time in the textile field, but have won wide acceptance because of advantages over existing materials. We will cover some of the applications of these emulsions, and the effect on various type of fabrics.

A-C POLYETHYLENE 629——The polyethylene referred to in the discussion is A-C Polyethylene 629, which is manufactured by the Semet-Solvay Petrochemical Division of the Allied Chemical Corporation. The polymer has the properties shown in Table I and can be formulated in nonionic, anionic and cationic systems.

DISCUSSION AND EXPERIMENTAL

NONIONIC EMULSIONS——Nonionics are the preferred type of emulsion for textile applications because of greater compatibility with a larger variety of other textile finishing chemicals. Nonionic polyethylene emulsions are compatible with both anionic and cationic finishing mixes; tolerate the presence of acids, polyvalent metal salts, amine hydrochlorides, other resin curing agents; and can be mixed both at high and low temperatures with other chemical products. Moreover, such nonionic emulsions do not yellow white fabrics, do not change dye shades, retain the chlorine resistance of the polyethylene and are freeze-thaw stable. These emulsions can be made of any desired particle size by varying the quantity and type of emulsifier.

ANIONIC EMULSIONS——Anionic emulsions have few applications in textiles and cannot be used with acid-curing thermosetting resins. The presence of large amounts of amines can lead to scorching, discoloration and "fishy" smelling fabrics if used with formaldehyde resin. This type has been used in conjunction with dyeing of softer colors. The emulsifier is driven off in drying, and the finish reduces dusting and improves sewing properties.

*Presented before the Niagara Frontier Section on December 5, 1958.

TABLE I
Properties of polyethylene

Melting point (°F)*	213–221
Needle penetration—dmm**	3–6
Acid number	14–17
Color—NPA	<1

*ASTM E28-51T
**ASTM D 1321-55T

TABLE II
Polyethylene emulsion formulation

Polyethylene	20%
Alkyl aryl polyethylene glycol	5%
20% Potassium hydroxide soln	1.5%
Water	73.5%

CATIONIC EMULSIONS——Cationic polyethylene emulsions are used to a limited extent. This type may become important for use in exhaustion type operations in fiber and yarn processing, and for wool finishing.

EMULSION PREPARATION——Semet-Solvay Petrochemical does not sell polyethylene emulsions, but only polyethylene solids. Polyethylene emulsions are available from textile speciality houses for mills who do not wish to make their own.

We will not go into details of emulsion formulation except to cover the recipe used for our test data. (See Table II).

EMULSION APPLICATIONS——Application of the polyethylene emulsion was made by padding, framing the fabrics, and drying for about ten minutes at 250°F. The wet pick-up of each fabric was measured and the amount of polyethylene deposited on the cloth calculated. All fabric tests were made after at least four hours conditioning at 70°F and 65% RH. Values of the various tests represent the average of three to five replicate determinations.

EFFECT OF POLYETHYLENE ON NATURAL AND SYNTHETIC FIBERS——The results obtained by treating a variety of nonblended fabrics of both natural and man-made fabrics are shown in Table III. The amount of polyethylene was calculated from the wet pick-up. With some of the fabrics, a slight reduction

TABLE III
Effect of polyethylene on natural and synthetic fibers

Fabric tested	*PE add-on (%)*	*Grab tensile strength (lbs) Warp*	*Fill*	*Tear strength Warp*	*Fill*
Cotton sateen	0	135	47	5.4	3.3
	0.6	112	56	6.2	5.5
Silk taffeta	0	60	23	2.6	2.4
	1.0	56	22	3.2	3.3
Rayon challis	0	54	47	3.1	2.9
	0.9	54	51	4.1	4.0
Dacron shirting	0	134	95	5.6	3.9
	0.5	137	93	11.1	5.6
Wool flannel	0	58	48	8.1	8.1
	0.6	59	52	8.3	9.9
Cotton 80 x 80	0	55	44	1.7	1.0
	0.7	51	38	2.5	1.7
Glass cloth	0	88	90	12.0	7.8
	0.3	109	96	17.3	16.9

TABLE IV
Effect of polyethylene on blended-fiber fabrics

Blended fabric	PE add-on (%)	Grab tensile strength (lbs) Warp	Grab tensile strength (lbs) Fill	Tear strength (lbs) Warp	Tear strength (lbs) Fill	Stoll flex abrasion cycles Warp
Cotton-rayon	0	58	60	1.5	1.2	180
	0.7	51	46	2.4	2.0	1030
Acetate-rayon	0	57	32	3.0	2.1	180
	0.7	59	33	3.1	2.6	200
Acrilan-rayon	0	130	118	3.9	3.6	400
	0.8	140	119	5.3	5.3	1730
Acetate-rayon	0	98	40	3.8	3.2	220
	0.8	97	40	6.5	5.2	480

TABLE VI
Varying concentrations of polyethylene on 80x80 cotton

Test		% Polyethylene in bath: 0	0.6	1.2	1.8
Stoll flex abrasion cycles	W	320	1080	1100	770
Tear strength—lbs	W	1.7	2.5	2.5	2.6
	F	0.9	1.7	1.8	1.8
Grab tensile strength—lbs	W	55	51	45	41
	F	44	38	38	39

TABLE VII
Varying concentrations of polyethylene on wool flannel

Test		% Polyethylene in bath: 0	0.6	1.2	1.8
Stoll flex abrasion cycles	W	1320	1990	1610	1530
Tear strength—lbs	W	8.1	8.5	7.8	8.8
	F	8.1	8.9	8.5	8.1
Grab tensile strength—lbs	W	58	60	62	61
	F	48	53	48	55

TABLE VIII
Varying concentrations of polyethylene on acetate rayon

Test		% Polyethylene in bath: 0	0.6	1.2	1.8
Stoll flex abrasion cycles	W	220	480	570	500
Tear strength—lbs	W	3.8	6.5	5.8	5.4
	F	3.2	5.2	5.0	4.3
Grab tensile strength—lbs	W	98	97	99	99
	F	40	40	40	46

in tensile strength was noted. This effect is common to other textile softeners and lubricants, especially in fabrics made of staple fibers. The important property to note, however, was the high increase in the tear strength of the fabrics with extremely small amount of deposited polyethylene. The silk taffeta, rayon challis and the cotton 80x80 were done by the Elmendorf tester, and the remainder by the tongue tear method. In the case of fiber glass cloth, both tensile and tear were increased by the polyethylene finish. Table IV shows test results on blended fiber fabrics. Note the high degree of improvement in flex abrasion resistance shown by the polyethylene treatment. The cotton-rayon and acetate-rayon tear tests were run on the Elmendorf and the remainder by the tongue.

PLANT - PROCESSED FABRICS ———Table V shows results of fabrics which have been treated with commerical polyethylene emulsions on a production scale. The formulations were of the same general type as used in the laboratory. The results demonstrate the ability of polyethylene to improve tear and flex abrasion.

POLYETHYLENE CONCENTRATION———Tables VI, VII, and VIII give the results of studies done on three fabrics to show the effect of different concentrations of applied polyethylene. On the cotton fabric, the amount actually deposited was 70% of the bath concentration. On the wool flannel, the amount was 60% of the bath concentration. On the acetate-rayon blend, the amount was 70% of the bath concentration given. These results show that the largest

TABLE V
Effect of polyethylene on plant-processed fabrics

Fabric tested	PE in bath (%)	Tear strength (lbs) Warp	Stoll flex abrasion cycles Warp
Cotton-Dacron	0	2.2	770
	3	2.5	2690
Cotton cord	0	—	940
	2	—	1820
Cotton twill	0	—	480
	3	—	1660
	5	—	1950
Rayon upholstery	0	13.0	550
	10	16.6	3000+
Acetate upholstery	0	14.2	400
	5	16.4	1100
Nylon-rayon	0	7.9	350
	3	14.2	1260

improvement in both flex abrasion resistance and tear strength was produced by concentrations of deposited polyethylene of less than 0.5% on the weight of the fabric. In fact, it appears that the improvements went through a maximum and then fell off. But even at the highest concentration, the tear and abrasion resistance was higher than the untreated fabric. On the acetate-rayon blend, there was no effect on tensile strength. On the wool flannel, there was a slight improvement. On the cotton fabric, there was a decrease in tensile from increasing concentrations of polyethylene. This is understandable since a major portion of a cotton fabric's strength is produced by the friction among fibers in the yarns, and this is reduced by the application of a lubricant.

POLYETHYLENE EMULSIONS WITH THERMOSETTING RESINS ———The largest single use of polyethylene emulsions in textile finishing is in conjunction with thermosetting resins for creaseproofing, stabilizing, glazing, embossing, and schreinering of cotton, rayon, and rayon-blended fabrics. In these applications, the polyethylene may be used to produce a particular hand, reduce dryness or harshness given by the thermosetting resins, or used as a processing aid to reduce friction in high-pressure calendering or embossing machines. The polyethylene may also be used as an aftertreatment to modify resin-treated fabrics which have been improperly finished.

COTTON———For cotton studies, four different types of resins used for creaseproofing and "wash-and-wear" finishes were selected. These included:

a) A 50% solution of dimethylol-ethylene urea.

b) A methylated melamine-formaldehyde resin.
c) A methylated urea-formaldehyde resin.
d) A water-soluble epoxy resin.

The padding solutions used on unmercerized but kier-boiled and bleached 80x80 cotton were as follows:

1) 10.0% Dimethylolethylene urea (50% solution)
   1.25% Modified zinc complex catalyst
2) 10.0% Methylated melamine formaldehyde
   3.20% Magnesium chloride catalyst
3) 10.0% Methylated urea formaldehyde
   1.5% Amine hydrochloride catalyst
4) 15.0% Water-soluble epoxy resin
   0.50% Polyvinyl alcohol
   1.50% Zinc fluoborate (40%).

Each of the formulations was also run with a 3% addition of a 20% polyethylene solids emulsion. In all cases, the polyethylene emulsion was compatible with the resins and catalysts, and gave a stable treating bath. These finishes were applied by padding at 70% wet pick-up followed by drying for five minutes at 250°F and curing for five minutes at 300°F. In no case did the presence of the polyethylene produce any yellowing. The polyethylene gave a smoother, softer hand than the resin control in all tests.

In Table IX are summarized the results obtained on tests of various mechanical properties of the fabrics. It should be noted that the presence of polyethylene resulted in higher crease-resistance improvement over that given by the resins alone. The polyethylene minimized reduction in tear strength caused by the resin. The same effect of minimizing or restoring the resistance to flex abrasion is shown in this table. The degree of improvement produced by the polyethylene varied with the resin. With two of the resin finishes, the polyethylene resulted in higher flex abrasion than the untreated control fabric.

The polyethylene had no effect on the loss of strength on chlorine beaching as measured by the standard AATCC chlorine damage test. This property is important in softeners which are used as additives to chlorine-resistant resins, especially on white fabrics. The polyethylene, as with other softeners, produced a slight decrease in tensile strength on cotton due to fiber slippage produced by the lubricating action of the softener. This effect is noted both in the presence and absence of resins. Changes in properties, shown in this table, resulted from a deposition of only 0.42% polymer on the fabric.

TABLE IX

Use of polyethylene emulsion with creaseproofing resin on 80x80 cotton

Resin applied	Emulsion applied (%)	Crease recovery angle (deg) Warp	Crease recovery angle (deg) Fill	Tear strength (gr) Warp	Tear strength (gr) Fill	Stoll flex abrasion cycles Warp	AATCC Cl₂ test (% loss in strength)	Grab tensile (lbs) Warp&fill
Dimethylol ethylene-urea	0	128	135	450	210	290	0	59
	3	140	144	670	350	1030	0	53
Methylated melamine-formaldehyde	0	132	135	490	210	280	17	62
	3	146	146	640	300	370	17	59
Methylated urea-formaldehyde	0	131	138	480	210	110	90+	53
	3	138	142	670	300	260	90+	49
Water-soluble epoxy	0	127	126	480	220	180	0	58
	3	128	131	530	290	840	3	61
None	0	69	71	750	430	490	0	89

TABLE X

Use of polyethylene emulsion with thermosetting-resin finishes on rayon-acrylic fiber suiting fabric

Finish	Emulsion applied (%)	Crease recovery angle (deg) Warp	Crease recovery angle (deg) Fill	Tear strength (lbs) Warp	Tear strength (lbs) Fill	Grab tensile (lbs) Warp	Grab tensile (lbs) Fill	Stoll flex abrasion cycles—warp	Top finished with PE
Cellulose ether	0	108	114	3.7	3.2	126	115	405	405
	3	121	132	6.1	6.1	127	122	>1000	>1500
Urea-formaldehyde resin	0	106	111	3.2	2.7	101	94	335	335
	3	133	134	5.3	4.8	108	99	>1000	900
Acetylene diurea	0	125	133	3.9	3.7	109	89	390	390
	3	141	142	5.7	5.8	111	93	>1000	1300
None	0	119	127	4.6	4.0	131	126	690	690
	3	122	129	5.9	6.2	138	122	>1500	>1500

TABLE XI

Use of polyethylene emulsion with thermosetting-resin finishes on viscose rayon challis

Finish	Emulsion applied (%)	Crease recovery angle (cycles) Warp	Crease recovery angle (cycles) Fill	Grab tensile strength (lbs) Warp	Grab tensile strength (lbs) Fill	Tear strength (lbs) Warp	Tear strength (lbs) Fill	Stoll flex abrasion cycles Warp
Cellulose ether	0	117	117	60	51	4.5	3.0	250
	3	128	131	62	58	5.9	4.9	670
Urea-formaldehyde resin	0	141	144	46	38	3.5	2.0	620
	3	150	153	61	52	4.3	3.5	900
Acetylene diurea	0	137	142	49	38	3.9	3.1	520
	3	142	145	50	41	4.7	3.1	860
None	0	111	114	63	54	5.1	3.1	810
	3	115	116	65	55	7.5	5.5	1250

RAYON-ACRYLIC FIBER SUITING FABRIC———An examination of the influence of polyethylene emulsion was made on a blended fabric containing Acrilan-viscose rayon fibers. The following finishes were applied:

5) 7.5% Water-soluble cellulose ether
   10.0% Aqueous 37% formaldehyde
   4.0% Dimethylolethylene urea
   4.0% Methylated urea formaldehyde
   0.5% Sodium sulfate
   0.5% Sodium bisulfate
6) 20.0% Methyl urea—60% urea formaldehyde 1:1.33
   5.0% Methylated urea formaldehyde
   1.5% Amine hydrochloride catalyst
7) 15.0% Acetylene diurea—formaldehyde—50%
   1.0% Zinc nitrate

Each of the above formulations was also run with a 3% addition of a 20% polyethylene solids emulsion. The fabrics were padded at 80% wet pick-up, framed to size, dried five minutes at 250°F, and cured five minutes at 280°F. Another series was run without polyethylene. After curing, these were top-finished with 3% of a polyethylene emulsion and dried. The results of mechanical tests are shown in Table X. The polyethylene greatly increased the crease-resistance values over those

TABLE XII

Elmendorf tear strength of resin-treated 80x80 cotton

% Softener in bath	Polyethylene Warp	Polyethylene Fill	Silicone Warp	Silicone Fill	Cationic Warp	Cationic Fill
			INITIAL			
0	500	260	500	260	500	260
0.5	720	400	620	320	610	320
1.0	740	430	740	370	670	380
2.0	740	430	740	420	670	380
			AFTER FIVE WASHES AT 160°F			
0	560	270	560	270	560	270
0.5	720	380	670	320	560	320
1.0	670	400	720	400	590	380
2.0	720	400	700	400	690	380

TABLE XIII

Monsanto crease recovery angle on 80x80 cotton (degrees)

% Softener in bath	Polyethylene Warp	Polyethylene Fill	Silicone Warp	Silicone Fill	Cationic Warp	Cationic Fill
			INITIAL			
0	121	134	121	134	121	134
0.5	128	132	132	138	122	127
1.0	130	136	132	139	129	134
2.0	132	139	137	142	131	139
			AFTER FIVE WASHES AT 160°F			
0	124	132	124	132	124	132
0.5	119	130	128	138	124	129
1.0	124	138	128	140	118	124
2.0	132	136	127	136	123	129

given by the creaseproofing finishes alone. The polyethylene improved tear and tensile strength. The flex abrasion resistance was increased over the untreated fabric. This was true whether the polyethylene was in the resin bath or applied as a top-finish. The emulsion, without resin, improved all of the properties tested.

VISCOSE RAYON CHALLIS——Treatments 5, 6 and 7 were applied to a 100% viscose rayon challis. The resins were applied alone and with polyethylene in the mix. The results of tests on these fabrics are shown in Table XI. The polyethylene in the resin mix improved all properties over those given by the resins alone.

COMPARISON OF POLYETHYLENE WITH OTHER SOFTENERS——Samples of bleached, but not mercerized, 80x80 cotton fabrics were treated with resin solutions containing:

8) 10% Dimethylolethylene urea.
1.25% Modified zinc complex catalyst
0-2% Softener.

The softeners included an emulsion with 20% polyethylene solids, a silicone (mixed dimethyl polysiloxane methyl hydrogen silicone) and a cationic fatty acid reaction product. The samples were padded at 70% wet pick-up, framed back to orginial size, dried for five minutes at 250°F, and cured for five minutes at 300°F. One-half of each sample was given five washes with soap and soda ash at 160°F in a Bendix automatic washer, and then dried on frames back to their original dimensions. Crease resistance and tear strength tests were made before and after washing. Table XII shows that the polyethylene emulsion was more efficient than the other two softeners at 0.5 and 1.0% pad bath concentrations, and more efficient than the cationic softener at all concentrations.

TABLE XIV

Scorch resistance on cotton 5% Product in bath

Finish	Rated scorching Minutes at 400° F One	Three	Five
None	0	0	0
Polyethylene	0	1	1
Silicone	0	0	1
Cationic	1	3	5

Scorch rating:
0—no scorch
1—very slight
3—moderate
5—marked

Table XIII shows the effect of different softener concentrations on crease resistance. These tests showed the lack of permanency of the cationic type.

HAND —— The polyethylene treatment improved the hand either when used alone or in conjunction with other finishing ingredients. Further modification of hand can be achieved by blending the polyethylene with quaternary ammonium compounds, epoxidized oil plasticizers, silicone oils and other nonfilm-forming lubricants.

RELEASE PROPERTIES——Polyethylene imparts good release properties on ironing and, in fact, can be used in liquid starches to give ironing release.

SCORCH RESISTANCE——The standard scorch test was performed at 400°F, but instead of 30 seconds exposure, one-, three-, and five-minute exposures were used. A rating of two is borderline for white fabrics. (See Table XIV). The polyethylene emulsion had excellent resistance to scorching. It was noted that some of the commercially available polyethylene emulsions were deficient in this respect, which indicated that emulsifiers were poorly chosen.

SOIL REDEPOSITION——Considerable publicity has been given to soil redeposition problems particularly in conjunction with "wash-and-wear" finishes. Many factors are involved in this problem, including fiber type and construction, finishing resin, supplementary finishing agents, finishing conditions, color, nature of the soil, and washing conditions. There is, as yet, no standard test accepted by the industry, and it is possible to design a procedure which will favor one material or another.

Our findings indicate that many softeners were completely removed during the first few launderings and were no longer a factor in soil redeposition. Once the softener is removed, it no longer contributes to important factors such as crease recovery, hand, tear strength, and abrasion. Polyethylene, which has been found to be present even after twenty launderings, was superior to most thermoplastics in reference to wet-soiling tendencies. At wash temperatures of 140 to 160°F, there has been no problem in home or commercial launderings. Laboratory washing tests at 180°F and over showed a slight tendency to pick-up soil, but laboratory experiments are much more alarming than appears to result from actual usage. Finishes should be field tested in order to get a better idea of soiling tendency.

CONCLUSIONS

Polyethylene can be emulsified in nonionic, cationic or anionic systems which are compatible with most common textile finishing agents. This polymer increases tear strength of unblended natural and man-made fabrics. The flex abrasion and tear strength of blended fabrics were improved. In conjunction with thermosetting resins, the polyethylene gives higher crease-resistance improvement over that imparted by the resin alone, and minimized reduction in tear strength and flex abrasion. A properly formulated emulsion is nonyellowing, scorch-resistant, and will impart improved hand. The polyethylene remains in the fabric even after twenty launderings.

Reactive Dyestuffs———

(concluded from page 40)

dyestuffs by the thermofix procedure. It is necessary to use selected disperse dyes, those which will withstand the concentrated alkali used in the padding operation.

The following Cibacete disperse dyestuffs are satisfactory and give good fastness to light and sublimation: Brilliant Yellow 4G, Yellow GWN, Orange DNA, Blue DBL, and Dark Blue RB. Polyester Red 2G is recommended for the red component.

The disperse dyestuff is pasted with an agent such as Solvadine BL at 105°F and diluted. The Cibacron dyes are dissolved as usual. The pad liquor is prepared by thoroughly mixing the disperse dye in 200 g/l urea, containing the dissolved Cibacron dyestuff, at 120°F. This is followed with the addition of 25 g/l crystal gum and 20 g/l soda ash or trisodium phosphate. This padding liquor is prepared at 120° F and should not be allowed to cool down during the padding operation.

Fixation is accomplished by treating the material for four to five minutes at 350°F. Thorough rinsing and soaping at boil removes the excess dyestuff.

This sample of yellow shows very good fastness to AATCC Wash Test III and no light break at eighty hours.

The navy blue shows a stain only on the acetate and nylon with Wash Test III. This sample was also exposed for 80 hours before a break.

APPLICATION TO OTHER FIBERS

ACRILAN———Preliminary work on yarn shows that the Cibacron dyes can be dyed on Acrilan using a stronger acid such as formic acid. Washfastness is good although the lightfastness is only mediocre and the pick-up moderate.

BAN-LON———Sample work on this fiber shows that the Cibacron reactive dyes may be applied by a modified wool formulation. Here are samples of scarlet and red with a 140° F wash test and a 30-hour light test.

NYLON ——— Filament nylon is dyed the same as Ban-Lon. Here again we do not recommend three-color combinations due to a blocking-out condition. Two-color combinations of orange, reds and scarlets are entirely practical.

Brightness of the reactive dyes has been a contributing factor to their acceptance in both the printing and the piece-dyeing field. Now, what happens when styles change? This was noticed shortly after their acceptance in the yarn-dyeing field. Here tans, grays, and slates, as well as the darker shades, found ready acceptance due to application and fastness properties. With the possible change in style trends, research is steadily at work augmenting the group to keep up with the demands of designers. During the coming year, we expect to have available a brown (not a mixture) with excellent all-around fastness, which will be very useful as a base for tans and browns. Also a violet with good lightfastness will find a ready market where water spotting has always been a problem. A new scarlet with far superior solubility to our present type is on its way. A new royal blue and a yellow brown with a #7 light rating, plus outstanding fastness to resin finishing, are already in the pilot plant stage. Along with these, will be additional Cibacrolans.

The ever-present problem of removal of inactivated or hydrolyzed dyestuff mechanically held on the fiber has not been by-passed in our research. We hope that an answer to this problem will be forthcoming in the not-too-distant future. When this can be solved and the washing requires no longer period than a vat or naphthol dye, it will be one of the first times that an entirely new concept of dyeing has been developed, applied and accepted by the industry in such a short period of time.

ACKNOWLEDGMENT

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Future Papers

THE following list is comprised of papers submitted to date for publication in future issues of the *Proceedings.* Authors and Technical Program Chairmen are requested to examine this list and call our attention to any omissions.

Papers Presented before Local Sections

"Acetate—A Basic Fiber for Nonwovens"—J L Barach and H W Coates, Celanese Corp of America

"Polymers as Related to Fabric Processing" — D Donald Gagliardi, Gagliardi Research Corp; Victor S Frank, Dewey & Almy Chemical Co; Lloyd H Perry, UBS Chemical Co; and Herman Mark, Polymer Research Inst

"Decorative Fabrics from Fibrous Materials"—Frank J Lachut, Owens-Corning Fiberglas Corp

"A Mild Cure Catalyst"—James B Irvine, Quaker Chemical Products Corp

"Mechanisms Influencing the Wash and Wear Characteristics of Cellulosic Fabrics"—C R Williams, Monsanto Chemical Co

"Fluorochemicals: The New Idea in Textiles"—Edwin J Grajeck and William H Peterson, Minnesota Mining & Mfg Co

"Blends of Polyfibers with Cotton. Advantages—Dyeing and Finishing Techniques"—Morton Santymire, E I duPont de Nemours & Co, Inc

"Probability of a California Textile Mill"—A C Hall, Mayor's Textile Committee for the Development of the Textile and Apparel Industries (Los Angeles)

"Synthetic and Natural Fiber and Yarn Processing Aids"— Charles H Lighthipe and Ralph G Schaubhut. Nopco Chemical Co

"Practical Experience with the Pad-Roll Dyeing Machine"—Robert M Lesh and Frank Percarpio, Northern Dyeing Corp; John S Thackrah, E I duPont de Nemours & Co, Inc

"Relation of Dye Structure to Properties of Disperse Dyes. 1) Anthraquinone Blues. 2) Diphenylamine Yellows"—V S Salvin and R A Walker, Celanese Corp of America

"Knit Goods of Orlon Acrylic Fiber—Processing and Dyeing"—G Robert Turner, E I duPont de Nemours & Co, Inc

Minutes———

198th Meeting

TECHNICAL COMMITTEE ON RESEARCH

THE 198th meeting of the Technical Committee on Research was convened at 1:30 pm on Thursday, April 2, 1959 in the Colonial Room of the Sheraton-McAlpin Hotel, New York, New York, with the chairman presiding. The following were present:

Members

C A Sylvester, *chairman*
G S Wham, *vice chairman*
W Anderson
W D Appel
R F Aurich
M J Babey
R F Caroselli
V L Chase
E J Chornyei
C W Dorn
W E Fayssoux
P J Fynn
N B Gobeil
R T Graham
T H Hart
W G Helmus
H F Herrmann
W A Holst
C Hooper
A E Johnson
S J Kennedy
G O Linberg
L S Little
G J Mandikos
J E Meili
T D Miles
L R Mizell
J D Mosheim
J E Norton
C N Rabold
G M Richardson
R E Rupp
B A Ryberg
C H A Schmitt
R B Smith
J G Stass
L S Thompson
C R Trommer
G W Wernz
H E Wilde
M W Winkler
C L Zimmerman

Others Present

C T Anderson
E Artim
H G Bryce
C S Clutz
E M Eddington
R A Ford
R C Geering
G M Kidder
R H Phillips
V S Salvin
H W Stiegler
G R Thompson

Chairman Sylvester opened the meeting by introducing W G Helmus, AATCC president, who presented Certificates of Service (for outstanding contributions to the Association and to industry) to the following:

A R Wachter, American Viscose Corp; retiring member, ECR.

M J Babey, Atlas Electric Devices Co; retiring vice chairman, TCR.

A E Johnson, National Institute of Drycleaning; retiring chairman, Committee on Drycleaning Test Methods.

J E Meili, consultant; retiring chairman, Committee on Colorfastness to Pleating.

R C Geering, Princeton Knitting Mills; retiring chairman, Committee on Flammability of Clothing Textiles.

G S Wham, Good Housekeeping Inst; retiring chairman, Committee on Wash and Wear.

The following were unable to be present and their certificates will be presented at meetings of their individual sections:

P B Stam, J P Stevens and Co, Inc; retiring member, ECR.

T F Cooke, American Cyanamid Co; retiring chairman, Committee on Resistance to Abrasion.

H E Millson, American Cyanamid Co; retiring chairman, Committee on Colorfastness to Crocking.

L R Burgess, Reeves Brothers Corp; retiring chairman, Committee on Definitions.

B R Norwick, Beaunit Mills; retiring chairman, Committee on Identification of Finishes on Textiles.

J Labarthe, Carnegie Institute of Technology; retiring chairman, Committee on End-Usage Performance Tests.

F J Rizzo, Quartermaster Research and Engineering Command, retiring chairman, Committee on Weathering of Textiles.

R H Souther, Cone Mills Corp; retiring chairman, Committee on Stream Sanitation.

M W Goodell, E I duPont de Nemours and Co, Inc; retiring chairman, Committee on Colorfastness to Wet and Dry Pressing.

I Schwartz, Bendiner and Schlesinger Laboratories; retiring chairman, Committee on Antibacterial Agents.

C Minoff, Texstyle Corp; retiring chairman, Committee on Colorfastness to Perspiration.

L L Heffner, North Carolina State College; retiring chairman, Committee on Evaluation of Fire-Resistant Textiles.

J A Zapp Jr, E I duPont de Nemours and Co, Inc; retiring chairman, Committee on Dermatitis.

P V Seydel, Seydel-Wooley and Co; retiring chairman, Committee on Evaluation of Desizing Agents.

Chairman Sylvester remarked that nineteen research committees had just concluded a series of meetings and that great progress and activity was indicated, much of which would be reported by subsequent speakers.

Mr Sylvester then continued with the following report:

"Two new tentative test methods have been approved by TCR since its last meeting:

1) Abrasion Resistance of Fabrics —Evaluation of Wear by Means of the Accelerotor.

2) Analysis of Finish in Textiles. The votes cast showed over 95% approval for both methods of test.

"The Joint AATCC-CATCC Technical Meeting to be held May 29th in Montreal, Canada will take the form of a panel discussion with AATCC appointing six men to give talks of 10-15 minutes on each of the following subjects: "Wash and Wear," "Chlorine Retention," "Colorfastness to Light," "Consumer Complaints," "Colorfastness to Washing," and either "Dimensional Changes," or "New Research Committee Activities." The chairmen of the committees directly concerned with these subjects will be asked to give talks and participate in the panel discussion. CATCC will also appoint six men to assist in the question-and-answer period and a moderator to run the meeting."

The chairman would request confirmation by the Executive Committee on Research of the following appointments to research committees:

J J Fox to the Committee on Colorfastness of Textiles to Atmospheric Contaminants, replacing N B Gobeil.

E Gula to the Committee on Colorfastness to Washing, replacing N B Gobeil.

R T Graham to the Committee on Evaluation of Finishes for Resistance to Staining and Soiling and the Committee on Water Resistance of Fabrics.

F Best to the Committee on Colorfastness to Pleating.

S P Hersh to the Committee on Antistatic Finishes.

E McCabe to the Committee on End-Usage Performance Tests and the Committee on Wash and Wear.

N B Gobeil to the Committee on Wash and Wear, replacing P B Stam.

R L Stutz to the Committee on Colorfastness to Pleating.

G L Drake to the Committee on Evaluation of Fire-Resistant Textiles.

J P Patton Jr to the Committee on Stream Sanitation.

G O Linberg to the Committee on Determination of Odors in Resin-Treated Fabrics.

A D Nacht to the Committee on

End-Usage Performance Tests.

H K Howard to the Committee on Damage Caused by Retained Chlorine.

Ethel McNeil as chairman of the Committee on Antibacterial Agents.

R L Ansler to the Committee on Soiling of Carpets.

S J O'Brien to the Committee on Soiling of Carpets, replacing T F Cooke.

Revision in Tentative Test Method 66-1956 ("Wrinkle Recovery Test"). E R Kaswell, chairman of the Reference Committee on Evaluation of Creasing Properties of Fabrics, has written a report summarizing the data developed on a comparison of the 1.5-pound and 500-gram weights as used in TTM 66-1956. On the basis of the test data and a poll of the Committee members, Mr Kaswell proposed that the 500-gram weight be substituted for the 1.5-pound weight in the test method. This proposal would bring the AATCC method in line with ASTM Test D1295-53T. A motion to accept the proposal was adopted.

Test for Electrical Resistivity Proposed as Standard. A request was received from the Committee on Antistatic Finishes that TCR recommend to the Council that Tentative Test Method 76-1954, Determination of the Electrical Resistivity of Fabrics, be raised to Standard. A motion that TCR make this recommendation was adopted.

Name Change for Committee on Antistatic Finishes. G R Thompson, Staff liaison for the Committee on Antistatic Finishes, presented a request from the Committee that its name be changed to "Committee on Static Electricity of Textiles", to indicate more accurately the scope of the Committee's work. A motion that the change in this Committee's name be made was adopted.

Short-Reference Numbering Code for AATCC Committees. The TCR secretary, G J Mandikos, reported on the development at AATCC Headquarters of a short-reference numbering system for AATCC Committees. This system (or code) was originally designed for use in AATCC records but has been found very useful in preparation of the manuscript for the *Technical Manual*. The listing of small numbers would expedite the filling out of registration cards during meetings. It could also be helpful to members in writing letters, reports, etc. The schedule of meetings in September, 1959, will include the numbers as well as the official names of committees.

Typical of these code numbers are the following:

C1—Council

C2—Executive Committee on Research

C3—Technical Committee on Research

C4—Publicity Committee

RR-1—Reference Committee on Colorfastness to Acids and Alkalis

RR-49—Reference Committee on Resistance to Insect Pests

RA-29—Research (Active) Committee on Resistance to Abrasion

RA-68—Research Committee on Determination of Odors in Resin-treated Fabrics

AATCC RESEARCH LABORATORIES———H W Stiegler, AATCC director of research, reported briefly on recent progress made on the major committee projects assigned to the AATCC Research Staff.

Dimensional Restorability. The Staff has worked closely with the Committee on Dimensional Changes in Textile Fabrics during the first quarter of 1959 in the writing of several drafts of Proposed Tentative Test Method 95-1959, "Dimensional Restorability of Woven Textiles after Laundering", preparatory to submission to TCR for letter ballot and eventual publication.

Chlorine Retention. One of the major projects is the one assigned to G M Kidder, staff liaison for the Committee on Damage Caused by Retained Chlorine. (Cf report by R F Aurich, chairman of the Committee on Damage Caused by Retained Chlorine, for a summary of current progress).

Abrasion Resistance. The Staff has assisted the Committee on Resistance to Abrasion in the preparation of several drafts of Tentative Test Method 93-1959, "Abrasion Resistance of Fabrics—Evaluation of Wear by Means of the Accelerotor", preliminary to publication in the *1959 Technical Manual* and in *American Dyestuff Reporter*. H E Glidden is currently working on the development of an edge-wear test using the Accelerotor, as requested by the Committee.

Technical Manual. G R Thompson, as Staff editor, has been busy on this activity, which involves collating and editing considerable volume of manuscript, editing of galley proofs, page proofs, etc in cooperation with W D Appel, editor of the *Technical Manual*. This effort is being made to meet established deadlines to insure that publication of the 1959 edition will not be delayed.

Washfastness. Exploratory tests on the development of a "mechanical" hand wash test have been conducted by Mr Glidden and Mrs Crane in cooperation with the Committee on Colorfastness to Washing. Further work on this project was outlined by the Committee at its April 1st meeting attended by Mr Mandikos.

COMMITTEE ON DAMAGE CAUSED BY RETAINED CHLORINE———R F Aurich, chairman of the Committee, reported as follows:

"The Committee on Damage Caused by Retained Chlorine conducted an interlaboratory test among laboratories not represented on the Committee. The purpose of this interlaboratory test was to determine the degree of correlation that would be achieved using the newly adopted Tentative Test Method 92-1958 on the Committee's standard resin-treated fabric by laboratories not so intimately familiar with the problem as those represented on the Committee. Approximately 25 laboratories were contacted, and 10 laboratories reported to date. The results were a source of gratification to the Committee in that a good degree of correlation was obtained.

"In view of the results of this study, it was decided that there would be a great deal of merit in carrying out a similar interlaboratory test with the same laboratories on the resin-treated fabric, which the Formulations Subcommittee is currently working on. This fabric is being deliberately prepared to give a low level of damage. Such an interlaboratory test would demonstrate the degree of correlation achieved on fabric giving a low level of damage as compared with the degree of correlation that was achieved on the standard resin-treated fabric which is in the high level of damage.

"The Formulations Subcommittee is having a great deal of difficulty in producing a "drift free" fabric for the Committee's experimental work. It had been decided originally that more fabric would be run in the original formulation used on the standard resin-treated fabric if it could be predicted that it would remain stable for a reasonable length of time. However, the Committee's experimentation indicates that the fabric "drifts" after only 14 days of storage. Consequently, the Committee is investigating other resin formulations in order to produce a fabric that will be stable a reasonable period of time before "drifting" to a higher level of

damage. It was also decided that the Formulations Subcommittee would produce a resin-treated fabric in a low level of damage consistent with the trend today wherein, on low-chlorine-retentive finishes, resins are used which give rather low levels of damage.

"The Prewetting and Chlorination Subcommittee and the Rinsing and Scorching Subcommittee have planned programs which are being held up pending the availability of the new resin-treated fabric from the Formulations Subcommittee.

"The Usage Subcommittee has reported on the results of certain commercial laundering experiments of the standard resin-treated fabric. This work is not yet completed and the Committee has not had a chance to analyze the data thus far reported. The Usage Subcommittee is also in the midst of conducting its home laundering experiments on the standard resin-treated fabric at four different laboratories.

"Work done at Lowell in the recent past would indicate that more concern should be paid to the non-uniformity of the fabrics employed in the Committee's work. From the large amount of data presented by Lowell on the subject, the Committee thought it advisable that, in the future, whenever the results of inter-laboratory tests are to be analyzed, consideration be given to what help the Statistical Advisory Committee of the AATCC might be in analyzing such data."

COMMITTEE ON COLORFASTNESS TO WASHING———R B Smith, chairman, presented the following report:

"The Committee approved, for submission to TCR, the method for Industrial Laundering (TTM 87-1958), which was altered to make the method applicable to all fabrics regardless of fiber composition.

"The following editorial changes were approved for wash test methods 36-1957 and 61-1957:

1) The multifiber test fabric shall be attached to the test specimen at one end.

2) The multifiber test fabric shall be attached with the individual fiber running lengthwise to the test specimen.

"A hand washing procedure was adopted for use in an interlaboratory survey. Six participating laboratories will subject a number of selected fabrics to five hand washings. These specimens will then be returned to Lowell as the basis for establishing a mechanical test equivalent to five average hand washings."

A motion was made that 1) the scope of Tentative Test Method 87-1958, Colorfastness to Industrial Laundering, be extended to include synthetic fiber fabrics; and 2) the wording regarding use of multifiber test fabric in Tentative Test Methods 36-1957 and 61-1957 be editorially revised for clarification as to the intent. The motion was adopted.

COMMITTEE ON COLORFASTNESS TO LIGHT———Chairman J E Norton reported as follows:

"Mr Switlyk, chairman of the new Statistical Advisory Committee, attended our meeting. The details of our proposed interlaboratory test of Group 2 (Laboratory Methods) was discussed with him and the details of the test were agreed upon. We have now collected all of the fabrics for this program, so it will be started in a very short time.

"We also discussed with Mr Switlyk the statistical analysis of the 12 consecutive monthly exposures at three locations by the langley method. To study whether the data developed by Group 1 (Sunlight and Daylight Tests) had any unintentional bias in it, Mr Rizzo ran spectrophotometric measurements on three sets of samples. These measurements also have been turned over to Mr Switlyk for use in his statistical analysis.

"The Committee felt that some changes were needed in our present carbon-arc-lamp method and these will be sent out for letter ballot of the Committee.

"For the current year, we received approval for $3000.00 to cover the proposed work of Groups 2 and 4 (Colorfastness to Weathering). Since we have been delayed in starting these programs, none of this money will be spent in the current fiscal year. It is therefore requested that this $3,000.00 be reapproved and made available to the Committee for use in the next calendar year."

COMMITTEE ON DRYCLEANING TEST METHODS———R T Graham, chairman, made the following report:

"A subcommittee headed by Genevieve Smith has presented a written procedure to be considered as a test to evaluate shrinkage in steam pressing. Several questions about the effects of some of the techniques in this procedure were raised by committee members, and it has been agreed that several laboratories should run tests on fabric to compare different steaming and pressing techniques. Representatives of the Textile Refinishers Association, present at this meeting, have offered to supply fabric samples for these tests.

"On the subject of considering a proposal to elevate the temperature to 160°F in the Colorfastness to Drycleaning Test, data showing the effects of several higher temperatures on colorfastness of various types of dyes were presented at the meeting. It was generally agreed that some temperature above the presently recommended 85°F is necessary. However, additional tests are needed and these will be run to determine the most desirable elevated temperature for the test."

COMMITTEE ON WASH AND WEAR———G M Richardson, chairman, reported as follows:

"The subject committee met today. Reports were received from the three active subcommittees as follows: Lighting and Photographs, Claude Clutz, chairman; Methods for Pleats and Creases, George Wernz, chairman; and Methods for Special Fabrics, Nelson Getchell, chairman. These reports are summarized briefly as follows:

"Lighting and Photographs. This subcommittee is considering revisions for improving both the lighting method and the comparative rating photographs. Their present thinking is leaning in the direction of less severe lighting in contrast to the present acute-angle lighting. Consideration is being given to other comparative photographs and plastic replicas.

"Methods for Pleats and Creases. There is an obvious need for methods for evaluating pleats and creases. Consideration has been given to the use of moderately severe lighting conditions for making comparison with photographs showing a range of performance from good to bad. The possibility of using replicas for this purpose is being investigated.

"Methods for Special Fabrics (embossed corduroy, pile fabrics, etc). The problems arising in the testing of these fabrics have been considered and active thought is being given to developing methods for coping with them.

"There is a feeling on the part of some of the members that garments should be considered in the scope of the tests being developed by this Committee. There is some controversy as to the appropriateness of this idea and an attempt is being made to resolve it through Committee action.

"It should be pointed out that the present method 88-1958 serves a useful purpose and there are no plans to completely replace it.

"Esther McCabe has been appointed secretary of the Committee."

COMMITTEE ON COLORFASTNESS TO WET AND DRY PRESSING———W Anderson, chairman, made the following report:

"The Committee discussed tentative test procedures designed to ascertain the reactions of dyed natural and synthetic fabrics to pressing, both wet and dry, at the recommended ironing temperatures for the fiber being tested. The tests include the reactions of the applied coloring matters to pressing periods of five, 10, 15 and 30 seconds. Procedures for ascertaining the resistance of dyed fabrics to sublimation under dry and moist heat conditions also were discussed.

"An interlaboratory investigation of these procedures is planned by the Committee."

COMMITTEE ON END-USAGE PERFORMANCE TESTS———A E Johnson, chairman, reported as follows:

"The Committee held only a general discussion of the problems of using the new Interlaboratory Statistical Forms for reporting consumer complaints. Eleven laboratories have indicated that they will participate in this program, and we expect that data for the initial three-month period will be submitted shortly for consolidation at AATCC Headquarters.

"The Committee considered recommendations received from the J C Penney Laboratory calling for a certain rearrangement of the forms and the addition of several new subdivisions, which appear to be needed to report complaints.

"It is recognized that the project has a long way to go before it will become fully operative, but it is agreed that the kind of data it will offer ultimately will prove very important to anyone who is concerned with the end-use performance of textiles.

"It was generally agreed that figures on complaint frequency have little meaning unless they can be related to the specific fiber, finish and end-use product involved.

"As soon as the cooperating laboratories have turned in their figures for the initial period, a report will be made to the Committee with the possibility of a special meeting being held to consider the report and its disposition."

COMMITTEE ON DIMENSIONAL CHANGES IN TEXTILE FABRICS———E Artim, Committee secretary, reported for J C Warner, chairman, as follows:

"1) The Committee finds that the three current Tentative Test Methods concerning dimensional changes in woolen fabrics, namely 73-1953, Shrinkage of Wool Hose, Accelerated Test; 74-1953, Relaxation and Felting Shrinkage of Wool Knit Fabrics (except Hose), Accelerated Test; and 41-1953, Dimensional Changes in Wool Textiles, Accelerated Test, need further changes before elevation to standards. Hence we are rewriting and combining all three methods into one test for determining dimensional changes of woven and knitted wool fabrics.

"2) The Committee has prepared, with the valuable help of Mr Kidder at Lowell, a proposed tentative test method #95-1959 covering the "Dimensional Restorability of Woven Fabrics After Laundering." We recommend approval of this test by TCR.

"3) In view of the approval by TCR of Tentative Test Method 91-1958, published in the October 20, 1958 issue of *American Dyestuff Reporter,* covering four test procedures varying in severity from very mild to very severe, and intended to cover the range of practical washing from commercial procedures to home hand washing, the Committee further recommends that TTM 40-1957, Dimensional Changes in Textiles other Than Wool, and STM 14-1953, Dimensional Changes in Cotton and Linen Textiles, be deleted from the next printing of the *Technical Manual.* These tests have now been replaced by TTM 91-1958, Test numbers I and IV.

"4) At present, our Committee is working on the final gap which needs to be filled regarding dimensional changes in textile fabrics; namely, a test covering dimensional changes in knitted textiles (excluding wool). This work is being undertaken in cooperation with an ASTM Task Group, which is currently studying the same subject."

A motion was made that 1) TCR be circularized by letter ballot on proposed Tentative Test Method 95-1959, Dimensional Restorability of Woven Fabrics after Laundering; and 2) TTM 40-1957 and STM 14-1953 be deleted from the 1959 *Technical Manual* (inasmuch as these methods were incorporated in TTM 91-1958, Dimensional Changes in Woven Fabrics (Excluding Wool). The motion was adopted.

COMMITTEE ON ANTIBACTERIAL AGENTS———H E Wilde, Committee secretary, read the report of the outgoing chairman of the Committee, I Schwartz, as follows:

"Six years ago, a committee was organized at the direction of the Executive Committee on Research to study the matter of treated fabrics claimed to possess bacteriostatic properties, and to devise a method which would serve as a guide or screening procedure to substantiate such claims.

"Up to that time, various methods had been used. The variations in results had been confusing, contradictory and unreliable and served only to plague investigators trying to agree on the proper procedure to follow. The Committee went to work facing this situation.

"About 20 meetings were held, which were well-attended and represented a good cross-section of the industry, such as textile mills, manufacturers of antibacterial agents, research members of department stores, former and present members of the Department of Agriculture and private laboratories engaged in such testing procedures.

"Interlaboratory tests were participated in by all of the members. Eighty-one samples, representing three antibacterial agents arranged in three strengths, were distributed to the members. Compilation of the results of these tests showed very good agreement and proved that the results are reproducible. For these tests, each member was supplied with a standard test culture and standard culture media from the same central source. The samples were prepared by one of the members and coded.

"After this there followed another interlaboratory test, using some of the modifications suggested by the members, and here again there was good agreement and reproducibility of results. Finally, after five years of interlaboratory study, a method was agreed upon and adopted unanimously by the Committee. As a result, the paper "A Tentative Method for the Detection of Antibacterial Agents", was published in the *Dyestuff Reporter* earlier this year.

"The Committee has looked also into the possibility of alternate methods. One such method, the subject of a recent study by the Committee, is described as the so-called smear method or streak method. Samples were prepared by the proponents of the smear method and distributed to the members by the smear-method proponents. Along with these, additional samples prepared by a Com-

mittee member were distributed at the same time, each sample being coded. Instructions called for the members to follow in detail the procedure outlined by the authors of this smear method and to run the AATCC Tentative Method, called the Pour Plate Method, as well. In all, nine samples were distributed to each of the members; four by the authors of the smear method, two of which were treated and two untreated. The five samples prepared by the Committee consisted of three untreated and two treated. Nine members participated in this study. There were five untreated samples and four treated samples.

"The results of this smear technique, as reported by the members and as compiled by our secretary, H E Wilde, showed numerous inaccuracies, particularly with the untreated (negative) control samples.

"In view of the lack of agreement with this smear technique and also because of the diversified interpretations given the results, it was felt that more time should be allotted for the study of the data and perhaps further testing. It was brought out that, in the absence of a clean zone of inhibition, there is an important factor in reporting untreated or laundered samples as passing; that is, when the fabric is lifted from the smear-method plate, bacteria adhere to the fabric and are removed by it, leaving a clean area (so-called window-pane appearance). On microscopic examination, this area often shows few or no discrete colonies. Plates prepared with an untreated piece of fabric using the smear method were shown to the Committee members, whereby the lifting of the untreated fabric removed the bacteria. In this demonstration *Serratia Marcescens* bacteria was used because of the red color produced and for the purpose of showing the window-pane effect, which area was without color whereas the rest of the plate was colored distinctly red.

"The Committee will continue to look into the possibility of adopting alternate methods and the study will continue to see where improvements can be made. The purpose should be to make the treated fabric fit the method and not the method fit the treated fabric.

"A great deal of interest has been created through the activity of this Committee and this should redound to the benefit of the textile industry in the production of antibacterial textile products to the end that the testing procedures adopted will serve the purpose for which the Committee was organized.

"A full and complete report of the technical work of the Committee is in preparation and will be published at a later date."

COMMITTEE ON BLEACHING ——Mr Sylvester read the following report submitted by A T Chadwick, secretary of the Committee on Bleaching:

"The problem of whiteness standards has been referred to the AATCC Research Committee for consideration of sponsoring a study at Lowell.

"A revised procedure for determination of the noncotton content of bleached cotton will be submitted to all Committee members for approval before the next meeting.

"It was agreed that this committee will recommend that all mills use 0.1N acid for determining the alkalinity of bleach solutions. A new AATCC test procedure will be prepared."

R B Smith stated that it was his understanding that ASTM Committee D12 was working on the problem of establishing whiteness standards. Mr Sylvester stated that he will check into this matter.

SCOPE OF RESEARCH COMMITTEES——A E Johnson, chairman of the Committee on End-Usage Performance Tests, proposed for consideration the desirability of changing the name of his committee in view of the current work reported above.

E Artim made the suggestion that the secretary of TCR write up the scope for each of the 38 research committees.

S J Kennedy felt that this subject should also come up for consideration by the Study Committee on Long-Range Objectives.

After considerable discussion on this matter, it was decided to postpone further discussion to the next meeting of TCR, which will be held September 10, 1959 in New York, NY.

The meeting was adjourned at 3:45 pm.

Respectfully submitted,
G J MANDIKOS, *Secretary*
Technical Committee on Research

AATCC Calendar

COUNCIL, COUNCIL COMMITTEES, RESEARCH COMMITTEES

May 29, 1959 (Mount Royal Hotel, Montreal, Canada) AM-Council meeting; PM-Joint luncheon and technical session with CATCC; Sept 9-11 (Hotel McAlpin, New York, NY); Sept 9—Research Committees; Sept 10—Council Committees, TCR, ECR; Sept 11 (AM)—Council Meeting

NATIONAL CONVENTIONS

Oct 8-10, 1959 (Sheraton Park and Shoreham Hotels, Washington, DC); Oct 6-8, 1960 (Sheraton Hotel, Philadelphia, Pa); September 28-30, 1961 (Buffalo, NY); 1962 (Southern Region)

DELAWARE VALLEY SECTION

May 22 (Annual Outing—Philmont Country Club, Huntingdon Valley, Pa)

HUDSON-MOHAWK SECTION

May 22 (Ladies night, Schuyler Meadow Country Club, Albany, NY); June 26 (Annual outing—Antlers Country Club, Amsterdam, NY)

METROPOLITAN SECTION

June 19 (Outing—North Jersey Country Club, Wayne, NJ)

MID-WEST SECTION

June 12-13 (Outing—Brown Lake Resort, Burlington, Wis); Oct 24 (Bismarck Hotel, Chicago, Ill)

NIAGARA FRONTIER SECTION

June 12 (Annual Outing—St Catherines, Ont, Canada); Sept 25 (Niagara Falls, Ont, Canada); Dec 11 (Annual business meeting, Buffalo, NY)

NORTHERN NEW ENGLAND SECTION

Sept 18 (Outing—Wachusett Country Club, West Boylston, Mass); Oct 16 (Lexington Inn, Lexington, Mass); Dec 4 (Joint symposium with ASME Textile Engineering Div, Smith House, Cambridge, Mass); Jan 15 (Woodlawn Golf Club, Newton, Mass)

PIEDMONT SECTION

June 5-7 (Outing—Grove Park Inn, Asheville, NC); Sept 25-26 (Barringer Hotel, Charlotte, NC)

RHODE ISLAND SECTION

June 12 (26th Annual Outing, Metacomet CC); Sept 18 (Management Night); Oct 23 (Prov Eng Soc, Providence, RI); Dec 4 (Annual Meeting—Johnson's Hummocks Grille, Providence, RI)

SOUTH CENTRAL SECTION

June 26-27 (Outing—Riverside Hotel, Gatlinburg, Tenn); Sept 19 (Hotel Patten, Chattanooga, Tenn)

SOUTHEASTERN SECTION

June 12-14 (Summer Outing — Radium Springs, Ga); Sept 12 (Ida Cason Callaway Gardens, Pine Mtn, Ga); Dec 5 (Atlanta Athletic Club, Atlanta, Ga)

WESTERN NEW ENGLAND SECTION

June 12 (Outing — Wallingford, Conn); Sept 25 (Blake's Restaurant, Springfield, Mass); Oct 23 (Annual Meeting—Rapp's Restaurant, Shelton, Conn); Dec 4 (Hartford, Conn)

INTERSECTIONAL CONTEST RULES

THE National Intersectional Contest Committee has announced the following rules to be used as a guide by the various sectional committees. They will supercede those published in the AMERICAN DYESTUFF REPORTER, July 14, 1947, and December 25, 1950. In general, only a few changes in the original rules have been made.

Further information may be obtained from the Committee Chairman, Thomas J Gillick Jr, American Felt Co, Glenville, Conn.

SUBJECT

Any subject may be selected, and it is assumed that it will relate in some manner to textiles. It is obvious that the strategy is to select a subject which satisfies one or all of the requirements which afford an opportunity to win a prize. There are certain limitations such as:

1) A Section should not use as the basis of its paper, work done by some subcommittee of the Technical Committee on Research. A Section may, however, extend or expand some phase of a general research project.
2) The finished paper should represent a contribution by a representative group of members in the Section; however, reasonable participation by invited nonmembers is permissible. Help may be obtained from schools, commercial laboratories, or industry to foster a committee's efforts, but not as a substitute for its own original work; nor may any school, commercial laboratory or industrial establishment claim credit for the work. It must be the property of the committee which presents it.
3) The subject should be of a nature so as not to involve the Association in patent controversy. Patentable processes or ideas should not be used as subject matter of contest papers since, when so used, they become the property of the AATCC.

It is important that committees be formed well in advance to provide sufficient time for carrying out the work. It is suggested that each committee be formed two years in advance of the convention date. If it is found that two Sections have chosen the same subject, the matter is brought to their attention so that they may continue on the same subject or not, as they prefer.

The title of the paper should not be released for publicity until approved by the National Intersectional Contest Chairman. All news releases must be handled through the National Chairman of Publicity.

SPEAKERS

Any member of the Association may serve as a speaker. He need not necessarily be a member of the Section for which he is speaking.

JUDGES

Any member of the Association may be a judge representing a Section. It is felt, however, that the judge should be, if possible, a member of the Section which he represents in order that each Section may be fairly and equally represented in the final judging. It is recommended that an alternate judge also be chosen so that he may carry on in the event that the first-choice judge is unable to complete his duties.

The judge chosen to represent a Section is free to call upon anyone for expert advice, as it is unusual for any one man to be competent in all fields covered by the different papers. The actual rating of the paper, however, is his privilege alone, and a rating sheet will be supplied by the "Chief Justice." The "Chief Justice" is appointed by the National Intersectional Contest Chairman.

RATING OF PAPERS

The papers of each Section are rated by the judges on the following basis:

For originality	30 points max
For scientific value	30 points max
For practical value	30 points max
For presentation	10 points max
Total	100 points

Each judge will rate each paper independently on the above basis, and the paper receiving the highest score will win the Contest. The paper with the next highest score will receive second prize, and the paper with the third highest score will receive third prize.

It is not necessary that a Section consider only subjects which meet all three qualifications of originality, scientific value, and practical value. Seldom can a Section produce a paper of this type. It may possess but one or two of the above features. However, the more nearly it does fulfill these requirements, the higher will be its rating.

A paper is acceptable even if a Section fails to complete the work as planned or its completed project produces only negative results.

The judges must submit a report of their voting to the "Chief Justice" just before the presentation of the Contest Papers. At the close of the Contest the judges then must submit their votes for presentation value.

DETAILS OF THE PAPER

The paper is not restricted as to length, but its actual presentation will be limited to 20 minutes. This means that a condensed version of the paper, emphasizing its high points, will be given at the meeting; the paper will be published in full in the *Proceedings* in the *American Dyestuff Reporter*. Please note that the paper is the property of the Association and is not to be released to any other publication.

An original and 18 copies of the paper must be furnished to the National Intersectional Contest Chairman at least two months before the Contest. These copies will then be distributed to the judges and the National Publicity Chairman. The judges need a full two months to read, review and rate the papers.

The papers should be typewritten, double spaced, using only one side of the sheet and leaving ample margins.

The original copy, which will be used for publication, must comply with the "Notice to Authors of Papers," which appears periodically in the *Proceedings* (cf *Am Dyestuff Reptr* of December 15, 1958, page P904).

EXHIBITS

Any request for exhibits or display features at the Contest should be made known at the time of submitting the copies of the paper to the National Intersectional Contest Chairman.

1959 AATCC NATIONAL CONVENTION

October 8, 9, 10 • Hotels Sheraton-Park & Shoreham, Washington, D C

THE EXECUTIVE COMMITTEE for the 1959 National Convention met in Washington, DC on April 13th to discuss progress and finalize plans for the Convention, which will be held October 8-10 at Washington. The Committee discussion indicated that the Convention will be the largest and one of the most successful ever held by AATCC.

L to r: Robert T Graham, National Inst of Drycleaning, chairman, Registration Committee; Joseph R Wiebush, National Inst of Drycleaning, chairman, Hotel Registration Committee; George P Fulton, National Institute of Drycleaning, chairman, Exhibits Committee; Ralph L Carr, Olin Mathieson Chemical Corp, chairman, Reception Committee.

L to r: John C Cook, W R C Smith Publishing Co, chairman, Printing Committee; George Lourigan, Harris Research Laboratories, Inc, chairman, Transportation Committee; Esther L Batchelder, Institute of Home Economics, ARS, chairman, Ladies Committee; Edward C Oliva, Harris Research Laboratories, Inc, chairman, Tours Committee.

L to r: John W Howard, National Cotton Council, chairman, Entertainment Committee; Nelson F Getchell, National Cotton Council, deputy chairman; Arnold M Sookne, Harris Research Laboratories, Inc, chairman, Technical Program Committee; Louis R Mizell, Harris Research Laboratories, chairman, Finance Committee.

Clockwise: George P Paine, executive secretary, AATCC; Leonard Smith, National Cotton Council, chairman, 1959 National Convention; Mrs M Fisher, secretary to Dr Smith; Mr Howard; Mr Getchell.

Elected to Membership*

DELAWARE VALLEY

H Dorn Stewart Jr (As)

FOREIGN

Bianchi Gerardo
James M Fulford (S)

METROPOLITAN

George J Leitner
David W Crookall (As)

NORTHERN NEW ENGLAND

Paul C Cassidy (As)

PACIFIC SOUTHWEST

George H Curtis
Rudolph F Fischer

PIEDMONT

Dwight B Morris
Gary McVey (J)

RHODE ISLAND

Victor A Jones

SOUTH CENTRAL

Johnny F Barkley
Bryan D England

WASHINGTON

Hazel E Harris
Doris I Rossman (J)

* Elected to membership on May 6, 1959. No designation after name indicates Senior, As indicates Associate, J indicates Junior, and S indicates Student. Individuals have been assigned to the Section or Student Chapter under which their names appear.

Membership Applications

RHODE ISLAND
Transfer (Student to Associate)

Paul S Bookbinder — Tech sales trainee, General Dyestuff Co, Providence, RI.

DELAWARE VALLEY
Transfer (Associate to Senior)

Donald P Feyler—Chemist, American Viscose Corp, Marcus Hook, Pa. Sponsors: I H Welch Jr, L L Walmsley.

METROPOLITAN
Senior

Ernst C K Kraan—Textile engr, Carbic Color & Chem Co Inc, New York, NY. Sponsors: G M Kidder, G J Mandikos.

Ira Kukin—Research Director, Research Lab, L Sonneborn Sons Inc, Belleville, NJ. Sponsors: J K Smith, J Turer.

Theodore R Trilling Jr—Gen mgr, American London Shrinkers Corp, New York, NY. Sponsors: A E Johnson, M Solomon.

Transfer (Student to Junior)

Guy D Moulton—Sales, Ciba Co Inc, New York, NY. Sponsors: S N Glarum, P J Luck.

Transfer (Student to Associate)

Zenon L Salewycz—Textile chemist, Reactor Laboratories, Paterson, NJ.

HUDSON-MOHAWK
Senior

Page G Mattice—Production chemist, General Aniline & Film Corp, Rensselaer, NY. Sponsors: W Drautz, H M Henze.

John H Paige—Area supv, dyestuff mfg, General Aniline & Film Corp, Rensselaer, NY. Sponsors: W Drautz, H M Henze.

PIEDMONT
Senior

Joseph B Corinth—Chemist, Collins & Aikman Corp, Ca-Vel, NC. Sponsors: J M Johnson Jr, G A Heath.

L Aubrey Goodson Jr—Director research, Dan River Mills Inc, Danville, Va. Sponsors: H Y Jennings, R L Wayland Jr.

Yates M Harbinson Jr—Supt finishing, Carolina Mills Inc, Newton, NC. Sponsors: J B Foster Jr, D H Kennemur Jr.

Kenneth C Isaac—Gen mgr, Carolina Mills Inc, Newton NC. Sponsors: J B Foster Jr, D H Kennemur Jr.

Associate

Joe J Cherry—Sales, F H Ross & Co, Greensboro, NC.

Transfer (Associate to Senior)

Charles B Palmer — Product mgr, mens wear, Abbeville Mills Corp, Abbeville, SC. Sponsors: H R Wallace Jr, L C Shive Jr.

Vernon S Ryan—Head dyer, North Carolina Finishing Co, Salisbury NC. Sponsors. E E House, V B Wright Jr.

William H Squier—Chemist, J P Stevens & Co Inc, Greensboro, NC. Sponsors: P B Stam, L B Arnold Jr.

SOUTH CENTRAL
Junior

John L Holleman Jr—Lab tech, Koppers Co Inc, Chem & Dyestuffs Div, Columbus, Ga. Sponsors: J D Mosheim, K C Ruppenthal.

SOUTHEASTERN
Senior

Clarence W Angline — Salesman, Augusta Chem Co, Augusta, Ga. Sponsors: W E Tiller, J C Cook.

George H Nusloch II—Sales rep, Olin Mathieson Chem Corp, Atlanta, Ga. Sponsors: F O Tilson, J T Hall Jr.

Perry G Myer—Lab mgr, International Latex Corp, Manchester, Ga. Sponsors: J W Richarson, W O Bozeman Jr.

MID-WEST
Senior

Robert A Johnson Jr — Foreman, dyeing & finishing, Faribault Woolen Mill Co, Faribault, Minn. Sponsors: J G Stott Jr, B Fay.

Kenneth J Sousa — Dyer, Lowell Bleachery Inc, St Louis, Mo. Sponsors: R H Meadows, W T White.

Associate

Richard J Klemer—Supt, Faribault Woolen Mill Co, Faribault, Minn.

Joseph G Strem—Research fellow, University of Minnesota, Minneapolis, Minn.

Transfer (Junior to Senior)

Donald M Rubin—Chemist, Chicago Printed String, Chicago, Ill. Sponsors: J G Kelley, J M Remsen.

PACIFIC SOUTHWEST
Senior

William A Ingham—Resident mgr, National Aniline Div, Allied Chem Corp, Los Angeles, Calif. Sponsors: T P Lee, W F Wigglesworth.

Activities of the Local Sections

Piedmont

PIEDMONT Section held its Spring Meeting April 10-11, 1959, at the Robert E Lee Hotel, Winston-Salem, NC. A total of some 260 members registered for the meeting and, with guests, made it one of the best-attended meetings held in the Piedmont Section.

The morning was devoted to meetings of the Sectional Research Committees. It was reported that the paper for the forthcoming Intersectional Contest is in its final stages and that the subcommittee working on the 1960 Intersectional Contest paper is progressing well. These meetings were attended by an estimated 140 members and interested guests.

The afternoon technical session was devoted to the presentation of two papers. In his paper, "Knit Goods of Orlon Acrylic Fiber, Processing and Dyeing", G Robert Turner, E I duPont de Nemours & Co, Inc, discussed the practical aspects of the dyeing of both hosiery and sweater types of knit fabrics composed of Orlon from the aspect of mechanical handling, temperature and dye selection to obtain dyeings and finished fabrics of best color and hand. The second paper, "Relation of Dye Structure to Properties of Disperse Dyes", by V S Salvin and J R Adams, Celanese Corp of America, offered a correlation of a wide number of related anthraquinone blues and diphenylamine yellows to various interesting properties of dyes, as gas fading, lightfastness, dyeability, solubility, etc, on secondary acetate,

PIEDMONT SECTION MEETING—APRIL 11, 1959—Standing, l to r: Fred Fortess, Celanese Corp of America, chairman, Piedmont Section Research Committee; Richard E Rettew, Polymer Southern, Section secretary; Vincent B Wright Jr, North Carolina Finishing Co, Section treasurer. Seated: Linton C Reynolds (left), Riegel Textile Corp, vice chairman; Joseph C King, Metro-Atlantic, Inc, chairman

PIEDMONT SECTION MEETING—APRIL 11, 1959—L to r: James E Greer, Burlington Industries, Inc, Sectional Committeeman in charge of the meeting; Joseph C King, Metro-Atlantic, Inc, Section chairman; Frederick C Wedler, president, Burlington Finishing Co, who introduced the speaker of the evening, George L Simpson Jr, director, The Governor's Research Triangle Committee, Inc

triacetate, and polyester fibers. Many interesting behaviors were noted that could be related to basic dye structure and composition. It was estimated that some 150 members and guests attended this technical meeting.

A well-attended social hour was followed by a buffet-style banquet, at which time A Henry Gaede, chairman of the Nominating Committee, presented the following recommendations of the Committee to the membership: *Chairman*—Linton C Reynolds, Riegel Textile Corp; *Vice Chairman*—Vincent B Wright Jr, North Carolina Finishing Co; *Secretary*—Richard E Rettew, Polymer Southern; *Treasurer*—Arthur R Thompson, Ciba Co Inc; *Councilors*—Neal A Truslow, United States Rubber Co, Edward A Murray, North Carolina State College, Raphael E Rupp, Southern Dyestuff Co, W E Rixon, Union Carbide Chemicals Co, Charles L Zimmerman, Dan River Mills, J C King, Metro-Atlantic, Inc; *Sectional Committee*—E Philip Lavoie, Stein Hall & Co, Inc, Gordon Eaves, Cloverdale Dye Works, John V Killheffer, E I duPont de Nemours & Co, Inc, E Thomas McIlwain, Warwick Chemical Div.

Frederick C Wedler, president, Burlington Finishing Co, presented George L Simpson Jr, as speaker of the evening. Dr Simpson, director, The Governor's Research Triangle Committee, Inc, discussed the Research Triangle of North Carolina, showing the high concentration of educational and research facilities presented by the location of such a triangle in the center of three major higher educational institutions, Duke, University of North Carolina, and North Carolina State College, within less than a 20-mile radius. Such facilities and willingness to cooperate in coordinated programs, it was pointed out, are unequalled in this country, particularly in view of the availability of land within the center of this triangle.

Some 224 members and guests attended the banquet.

Western New England

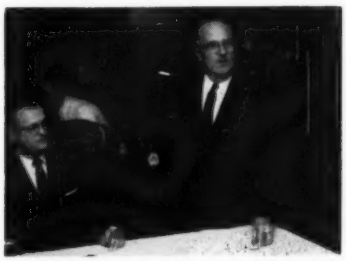
ON Friday evening, April 17th, the scheduled meeting of the Western New England Section was held at Rapp's Restaurant in Shelton, Conn.

Allen J McQuade, U S Quartermaster Research and Development Command, Natick, Mass, presented a paper entitled "A Discussion of Flame-Resistant Finishing." His paper was followed by a discussion period from the floor.

There were approximately 35 members and guests present at this meeting, including George C Parks, AATCC vice president (New England Region).

WNE MEETING OF APRIL 17—L to r: Henry J DeMarco, Shelton Hosiery Mills, Inc; Andrew W Goodwin, Princeton Knitting Mills, Inc, chairman; Peter P duBiel, Cheney Bros; Albert H Rant, Laurel Soap Mfg Co, vice chairman

Allan J McQuade (standing) delivering his paper "A Discussion of Flame-Resistant Finishing" before the Western New England Section. Seated at Mr McQuade's right is Nathaniel J Glade, American Cyanamid Co, a past chairman of the Section. WNE Chairman Andrew W Goodwin is at the speaker's left



W George Parks, Univ of Rhode Island, AATCC vice president from the New England Region, addressing the Western New England Section on April 17

R C Geering, Princeton Knitting Mills, Inc, asks question from the floor. PKM's Timothy J Horan, WNE secretary, is seated

ORGANIZATION OF THE AATCC

FOUNDER

LOUIS A OLNEY
(deceased)

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WILLIAM R MOORHOUSE
PO Box 352, South Yarmouth, Mass

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Study Committee on Endowment Fund ..... P J WOOD
Committee on Individual Membership H A STAUDERMAN
Study Committee on Location of National Headquarters ..... SYDNEY M CONE JR

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Research Associate ..... GLEN M KIDDER
Research Associate ..... HARLAN E GLIDDEN

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Central Atlantic Region

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STUDENT CHAPTERS

Alabama Polytechnic Institute, Bradford Durfee College of Technology, Clemson College, Georgia Institute of Technology, Lowell Technological Institute, New Bedford Institute of Technology, North Carolina State College, Philadelphia Textile Institute, Rhode Island School of Design

MAY MOTET
1959

Inter Alia—Inter Nos

P J WOOD

RETIREMENT

Charles Lamb, who lived from 1775 to 1834, and so never saw a radio, an automobile, a telephone, a sputnik or a cold war, surveyed this subject in an essay called "The Superannuated Man." Among other things he delivered himself of the following:

> "Let me caution persons grown old in active business, not lightly, nor without weighing their own resources, to forego their customary employment all at once, for there may be danger in it."

Evidently Charles, who wrote also under the pseudonym of "Elia", as you will recollect, was not impressed with the matter of retirement; and we must remember that it is unlikely that he referred to the present-day system of compulsory retirement, of which we find no record in our cursory research on the subject. It is likely that the usual procedure was to throw out old employees without too much ceremony, as Scrooge was about to do in the case of Bob Cratchitt, had it not been for the intervention of Marley's ghost and the Spirits of Christmas Past, Present and Future, who performed a miracle on the old curmudgeon, turning him into a half-way decent bloke, earning him the blessing of Little Tim.

The other week we were travelling down to Seton Hall University with our long-time friend, Herbert Fox, to attend the executive committee meeting of the ACS's North Jersey Section of which Dr Fox is chairman this year, and which we attend ex officio, as chairman of Passaic Valley Subsection; talk turned on the subject of retirement, your scribe taking the position that no hard-and-fast rule of retirement according to chronological age could really be satisfactory, as so much depended on the retiree's actual or physical age, his interest in his work as a vocation, rather than as a pure-and-simple meal ticket, and various other factors, while Herbert was 100% sold on the idea of retirement at 65.

However, he did agree with Lamb to the extent that he felt that gradual acclimatization to the concept of ultimate retirement should take place by arranging what one might call a diminishing work program for the prospective seceder from the ranks of daily toilers, the work load being progressively reduced and the loafing load, so to speak, being slowly magnified.

There is much to be said for this opinion, although Dr Fox is firmly of the feeling that the probationary period should start at sixty, so that the transition could be completed by 65, while we would favor starting at 65, and concluding the change-about by the age of 70; probably 72 would be even better, as that is the age at which one is allowed to earn any amount without accounting for it against receipt of the Social Security pension.

How much Herbert's thinking is influenced by the fact that he is an accomplished and apt sculptor, it is impossible to say. But many of the parties of the first part in the matter of retirement have no avocation of this nature into which they can funnel their aged energies, if any. And Dr Fox has an unlimited supply of energy and always will have it, seemingly.

Year after year, mandatory retirement at 65 is costing industry more and more in pensions and this retired army grows annually and dissipates its vigor in attempting to find other outlets for its far-from-exhausted force.

A recent Dun & Bradstreet survey quotes half the company presidents interviewed as feeling that some part of the problem might be solved by raising the conventional retiring age to 75.

Says "Curt" Curtis, one of our chief research chemists, "The best definition of knowledge that we have heard is that it is the accumulation of human experience. Yet we have the paradoxical situation in which many, who have acquired a lifetime of experience and know how, are sidetracked at an age that is productive but chronologically unacceptable to the perhaps too rigid requirements of organization charts. This seems to us to be a waste of brainpower that could be used productively, in some way, in the organizations of those selfsame chemists."

It is impossible to put a brake on the wheels of time, but we can, at least, keep from farcing around (as the English say) like an old man, all out of gas.

MORE FROM OUR ALLIES, MESSMATES, COADJUTORS AND CONFIDANTS

Some kind individual from American Viscose (might have been Landy Battista or possibly Arthur Wachter) sent us a small pocket-sized booklet chock full of useful information about viscose and about nearly every other fiber extant. If we were asked to comment on the book, which we were not, we would suggest a couple or three additions to the short bibliography on page 21. Here they are:

"Modern Textile Dictionary" by George Linton, 1957, 2nd printing
"Handbook of Textile Fibers" by Milton Harris, 1958, 2nd edition
"Fabric Defects" by J B Goldberg, 5th printing.

The copy we have of the last named was sent us by the author and we have no hesitation in saying it is the best weapon of the troubleshooter we have yet seen. It is beautifully illustrated and is couched in the lucid terms that we have come to expect from this author. Incidentally, Jay was the program chairman of the recent TRI annual meeting and presided at the sessions on the first day, serving as emcee at the luncheon on the Tuesday. He left us with a very subtle way of avoiding use of the expression "our old friend" for which he deftly substituted "a friend of long standing". Clever, eh? Thank you, Jay, both for the splendid book and for the "verbal detour."

At the annual meeting of TRI we made many pleasant contacts with many whom we see but rarely, particularly those who are engaged purely in the field of fibers, Bob Schofield and Jerry Mecco, those well known Cyanamidians; John Redston of E F Drew; Hans Luttringhaus of Carbic, with his merry cadenza of laughter; Eugene Schwarz, who now has offices both in New York and Newark; Nat Glade, who certainly does not look 25 years older than he did when we first met him at Mount Hope about that length of time ago; Carl Setterstrom, apparently enjoying life with his new connection, AviSun Corp; Steve Marks and Ken Howry, editors of Daily News Record; Stanley Sucheki of Textile Industries, Bill Davidson, our former accessory before and after the fact on the late lamented Textile Age, now a member of the staff of Modern Textiles; and Charlie Whitehead, managing editor of the Dyestuff Reporter, with whom we had the pleasure of sitting at lunch. A right merry company withal.

Julian Jacobs was looking forward to the time of his retirement; he was running the last lap and formally gave up the job of editor of Textile Research Journal on May 1. Ave atque vale, Julian.

A letter from Paul M Platzman lets us know that his company is on the verge of putting on the market the first successful ultrasonic dishwasher. "These ultrasonic waves" says Paul, "at 40,000 cycles per second, far above the range of human audibility, alternately compress and decompress the water in the sink. This action causes myriads (no, Elmer, they have nothing to do with Nereids, even if they do live in water; this is no fairy tale) of tiny vacuum bubbles to form and collapse with tremendous force, which 'blasts off' all traces of contamination from the items being washed."

From time to time, we have referred to this ultrasonic vibration as a possible means of driving dyestuff into those fibers that do not want to have dyestuff driven into them. It would be a million times easier to handle than carriers or pressure dyeing, in our humble opinion, especially when it comes to piece goods. Just wait and see!

Henry Grimes, who is the youngest charter member of AATCC, wrote us recently and we were right glad to hear from him. He went into YMCA work some years ago, as a permanent vocation; quite a change from being chemist at the American Woolen Company, being right hand man to Alex Morrison. Alex was national secretary at AATCC at the time we sat in the chair. Why is Henry the youngest charter member? Elementary, my dear Watson———he was one of the organizers and, as he was under the age limit, an exception was made in his case.

ULTRASONICS

Reference has been made above to the use of vibrations of a magnitude beyond the audible range in the washing of dishes, but this is by no means the end of the story, according to an article in the April number of "Popular Science" designated "How Silent Sound Now Works for You".

This interesting magazine, which has the faculty of focussing even the nontechnical mind on many an intriguing scientific subject, says that other household applications are on the way including air cleaners to entrap dust in conditioning apparatus, laundry washers and possibly an ultrasonic bathtub. It is quite possible that this latter use may be so pleasurable that, instead of having to drive children into the weekly total ablution, it will be quite a job to keep them from becoming bath-addicts, insisting on the daily-bath^{x}; x being 2 or any number above 2.—Q.E.F.

• PATENT DIGEST •

PAUL WENGRAF

VARITONE CLOTH DYEING METHOD———Color applied to compressed fabric in rope form C, 6

U S Pat 2,823,092 (Un Merchants & Mfrs——Spencer——Feb 11, 1958).

Dyeing effects, ie, different shades, may be produced simultaneously on a fabric by forming a rope, coloring it a) by dipping in a dyebath with subsequent squeezing or b) by padding the rope between dye-liquid transporting rollers, finally opening the rope to the full width by an expanding device, and optionally fixing the dye by curing and drying.

By dyeing according to method "a," one may obtain "finger painting" patterns, which are characterized by an overall random application of the color in different shades. This effect is schematically demonstrated in Figure 1.

When dyeing is done according to method "b," noncolored areas will appear between colored portions, as shown in Figure 2. This effect has been termed "marbleized."

A schematic of the apparatus to be used for method "a" is shown in Figure 3. Fabric (20) is formed to a rope by passing through poteyes (26 and 29). It is then immersed into dyebath (32), squeezed by rolls (37,38), reopened to full width at expander (43), and led over heating cans (44-47) before being folded in laps at 48. According to procedure "b", the rope does not pass through the dyebath, but is directly impregnated between two squeezing rolls, the lower one dipping in a dyestuff solution.

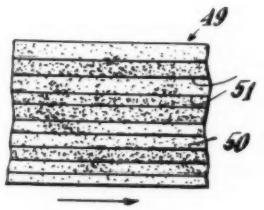

Figure 1
USP 2,823,092

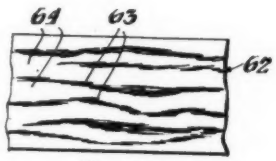

Figure 2
USP 2,823,092

A special modification calls for a previous impregnation of the rope by a dye resist, which is applied from squeeze rollers (as in "b"). The fabric is then subjected to either of the aforementioned dyeing procedures or to a regular open-width dyeing operation. This modification somewhat resembles the known Batik methods.

The multitone effect is heightened in appearance by the addition of a pleating operation. Obviously many variations can be achieved by selecting appropriate dyes and by combining "a" and "b," etc.

References cited by the Patent Office:

US Pat 1,566,690 (Am Tissue Mills/1925): ornamental crepe paper may be produced by applying a design to the paper prior to creping. The final product shows irregular patterns.

US Pat 1,655,973 (Ross/1928): multicolored patterns may be obtained in dyeing processes by twisting the fabrics, dipping them first in a liquid (optionally water but also dye liquids), wringing out excess liquid, and dipping them in various dyes of different colors.

US Pat 2,695,653 (Cranston Print Works/1954): unidirectional wrinkles may be produced in a fabric by pressing moistened sheet perpendicular to the longitudinal axis through high-pressure rollers, thus forming substantially parallel wrinkles that are washfast whenever the goods have been previously impregnated with hardenable resins.

DEVELOPMENT OF SPECIAL ICE-COLOR PRINTS in neutral steam D, 2, 04

U S Pat 2,822,234 (Farbenfabr Bayer——Breig, Glietenberg——Feb 4, 1958).

Ice colors of the insoluble azo class and related compounds that contain the usual coupling components and stabilized diazoamino compounds generally are developed after printing by a treatment with dilute acids or preferably with acid steam. To offset some disadvantages inherent in the acid-steam process, a fixation method in neutral steam has been developed, based on reducing the amount of alkali in the past and, on adding substances, which split off acids during aging (US Pat 2,758,001 —see references which follow).

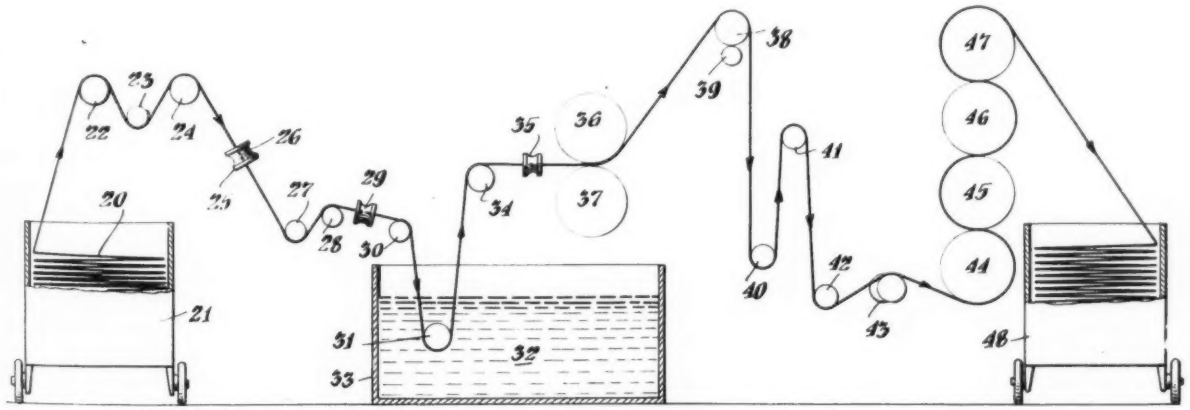

Figure 3—USP 2,823,092

According to the current specification, an ideal case would be a combination of ice color components developed in neutral steam without need for adding the abovementioned acid-splitting compounds. Thus diazoamino compounds had to be found which would split easily and completely in neutral steam, while remaining stable in the cold. This problem reportedly has been solved by using as diazoamino compounds combinations of dihalogeno alkyl (or alkoxy) anilines with 2-alkylamino—5(4) sulfobenzoic acids. Printing pastes which contain diazoamino components of this type plus alkali salts of regular coupling components yield strong prints on developing in neutral steam, while keeping well in the cold. A further advantage of these ice colors is that they are not substantially affected by reducing agents or alkalis carried over when printed alongside vat colors.

Example: The diazoamino compound is prepared by running diazotized 1-amino-2-methyl-4-5-dichlorobenzene into a sodium carbonate alkaline solution of 2-ethyl-amino-5-sulfobenzoic acid (stabilizer). A mixture of equivalent parts of this solution and 1-(2'-3' hydroxy naphthylamino) -2-ethoxybenzene (homolog of CI Azoic Coupling Component 20) is dissolved in alcoholic caustic and water plus a thickener. After being dyed, the goods are aged for five to ten minutes in neutral steam, soaped, rinsed and dried. The prints are found to be deep, clear and fast to light.

Among the references cited by the Patent Office:

US Pat 1,882,561 (Gen Aniline Works/1932) describes ice-color preparations made from diazoamino compounds and naphthols stabilized with sulfoamino benzoic acid.

US Pat 2,338,639 (Calico Printers' Assoc/1944): process for printing and dyeing with insoluble azodyes developed on the fiber. It calls for diazotization of aniline or derivatives, reaction with an aminocarboxylic acid of the benzene series in presence of fixed alkali to form the corresponding alkali salt, and coupling in situ on the fiber by aging with acid-free steam.

US Pat 2,758,001 (Farbenfabr Bayer/1956): ice colors for printing or dyeing, which are to be developed in neutral steam, are prepared from alkali salts of ice color-coupling components and neutral alkali salts of diazoamino compounds. The latter contain, as a solubilizing group, an amino-alkyl sulfonic acid radical such as SO_2 -(CH_3)N-$C_2H_4SO_3H$.

EXTENDER PASTES IN O-I-W EMULSION PRINTING D, 2, 07

U S Pat 2,825,707 (J R Geigy SA——Auer——March 4, 1958).

According to the preamble to this patent, water-in-oil emulsions are still used frequently in pigment printing. They may be preferred, despite the known fire hazard and trouble in cleaning the equipment with solvents, because the "color mileage" (ie, the color value) is higher than that obtained with oil-in-water emulsions. The present invention intends to show a way to improve the yield of oil-in-water emulsion prints, up to the color value generally obtained in water-in-oil paste printing, by the use of specific extenders.

It has been observed that clear emulsions of the o-i-w type do not yield satisfactory color values because of large amounts of solvents and improper selection or proportions of protective colloids. Thus, this invention aims to establish the optimum conditions by using specific o-i-w clear emulsions. This method can be applied to pigment, vat, acid, naphthol prints and discharges as well.

The inventor refers to a copending application, which calls for the use of three main ingredients in the clear solution:

A) High-viscosity methylcellulose or carboxymethylcellulose as a protective agent. Methylcellulose is preferred for pigment prints while sodium carboxymethylcellulose is preferred for vats and discharges.

B) Water, the content of which is limited to 61% (preferably 51%). Higher content reduces the color value.

C) Water-immiscible solvents of the hydrocarbon group. Aliphatic hydrogen solvents applied in amounts of 40-60% are said to give greater brilliance than do aromatic hydrocarbons. Slower-evaporating solvents may be preferred by reason of lesser fire hazard, but solvents which evaporate ahead of the water give clear prints without requiring any aftertreatment.

Optionally, the following may also be used in the clear emulsion:

D) An emulsion of a solvent-soluble resin as a reinforcing agent. Quite generally, solvent solutions of water-insoluble resins are used.

E) A small content of surfactant.

F) A sulfoxylate in discharge prints.

Addition of reinforcing agents is of particular advantage in pigment prints and especially in cases where longer extensions are applied. According to the examples, the paste may contain oil-modified polyester resins or butylated melamine-formaldehyde resins (Melmac 245-8) emulsified with carboxymethylcellulose.

The whole o-i-w emulsion consists of the abovementioned components A, B, and C, mixed with the reinforcing o-i-w resin emulsion and a vinyl polymer-type artificial latex.

The specification contains many details regarding preparation of the pastes and application in the field of printing pigments, dyestuffs of various other classes, and discharges.

References cited by the Patent Office:

U S Pat 2,637,705 (Auer/1953) covers an o-i-w printing emulsion containing a highly viscous water-soluble cellulose ether and a water-soluble amino-aldehyde resin in the aqueous phase and a water-immiscible hydrocarbon solvent in the lacquer phase.

US Pat 2,197,357 (Ciba Prod Corp/1940) describes resinous condensates from triazines (melamine) and aldehydes and a compound containing at least one hydroxy group, such as alcohols or alkyd-ester-type resins.

PIGMENT PRINTING WITH O-I-W EMULSIONS————Crocking fastness improved D, 2, 07

U S Pat 2,825,708 (J R Geigy SA——Auer——March 4, 1958).

The preamble to this specification discusses the drawbacks in printing with water-in-oil emulsions. Oil-in-water emulsions are easier to handle but give comparatively lower color values, and also, quite generally, the crocking fastness of pigment prints is poor. These conditions reportedly are improved by the current method.

Improvements in methods of applying o-i-w emulsions are discussed in the same inventor's U S Pat 2,637,705 (referred to in copending U S Pat 2,825,707; see preceding abstract) and in U S Pat 2,637,711 (see references below). The first-mentioned patent describes changes in the extender pastes, which are important for increasing the color values of pigment and other prints. According to the current invention, a pigment paste of the o-i-w type is prepared by using a) a pigment slurry containing the pigment, a pigment-dispersing agent, water, and optionally, a protective colloid; b) the oil-phase component, comprising the resin binders for the pigment, solvents, driers, etc; and c) an appropriate emulsifier. The pigment slurry may slowly be added to the oil-phase component while agitating, or, alternatively, the oil-phase component may be emulsified in the pigment slurry. The emulsifier can be

incorporated either in the pigment slurry or in the oil-phase component or in both. Improved resistance to crocking and laundering is claimed while higher percentages of pigments and lesser amounts of binders can be employed.

Pigments to be used in the slurry are exemplified by phthalocyanines, insoluble azodyes, inorganic pigments, carbon black, and many others. The concentrate paste may contain up to 20% organic or up to 40% inorganic pigments. The aqueous slurry should contain a dispersant to deflocculate the pigment, protective colloids, antifoaming agents, etc.

The constitution of the oily phase seems to be important. The resin emulsion surrounds the deflocculated pigments, thereby preventing crocking. As binder resins, drying fatty acid ester-modified epoxy resins and styrenated alkyds, modified with such higher fatty acids, are mentioned in the examples. As a rule, the better drying a fatty oil (having more than one double bond), the more suitable it proves to be in the present process.

A great variety of emulsifying agents is suitable, especially nonionics, but in some instances cationic and anionic assistants are also effective.

The basic characteristic of the patented method appears to be that the emulsification of the resin binder is carried out in the presence of dispersed pigments. Many illustrative examples and details of procedure are offered.

A further improvement is the use of the special extender pastes in connection with concentrates prepared according to the current process. (See preceding abstract).

Among the references cited by the Patent Office:

U S Pat 2,342,581 (O'Neil-Duro Co 1944) describes an o-i-w pigment printing emulsion containing colloidally dissolved methyl cellulose as a dispersant.

U S Pat 2,494,810 (Geigy Co Ltd/1950) describes an o-i-w emulsion wherein the pigment is dispersed in the aqueous phase by means of a nonconvertible (nonhardenable) alkyd resin plus an amine or ammonia, while the lacquer phase contains a solvent-soluble hardenable resin.

U S Pat 2,637,711 (Auer/1953) describes an o-i-w emulsion containing the hydrophobic pigment in the aqueous phase, the dispersing agent for which is a higher fatty alkylsulfate.

FLAMEPROOFING with additional products of alkalifluorides and boric anhydride G, 2, 03

U S Pat 2,823,145 (Du Pont——Clare, Deyrup ——Feb 11, 1958).

Boric acid, borax, and silicates frequently are used to flameproof textiles or paper. Silicates cannot be applied whenever the material is sensitive to alkalis, while boric acid compounds have a limited water solubility and tend to give crystalline deposits that dust off the substrate after drying.

According to the present invention, alkalioxyfluoborate of the formula $4NaF \cdot 5B_2O_3$ (one mol NaF on 1.5 moles B_2O_3) has been found to be a superior inorganic flameproofing agent of extreme water solubility. It is prepared by fusing sodium (optionally potassium) fluoride and boric acid anhydride in the proper stoichiometric ratio. The addition reaction is characterized as a mutual solubilization. The obtained solids form thick viscous solutions.

Example: Samples of muslin were dipped in 5, 10 and 20% solutions of sodium-oxyfluoborate, and samples of duck in 4, 8 and 16% solutions of the same compound. The specimens were tested according to the 45° angle method [cf *Ind Eng Chem* 42 421-23 (1950)]. Samples treated with the higher concentrations gave results comparable with those obtained with a commercial flameproofing agent of 14-15% concentration (ammonium sulfamate) by showing no afterflame or afterglow.

Among the references cited by the Patent Office:

U S Pat 2,420,644 (Pemco Corp/1947) describes a fusion process for manufacturing lead-borosilicate to be used in suspension in finely divided form, optionally in the presence of highly chlorinated organic flame retardants. [Cf *Am Dyestuff Reptr* 36, 547 (1947).]

Abstracts———

(concluded from page 37)

increase in hydration of the carbon particle results from NaCMC usage.

Precise measurement of deposited soil has been difficult by reflectance methods; use of radiotracer-tagged soils, only recently begun in this field, promises aid in elucidating the soil suspension mechanism.

The author suggests that, considering the complexity of these dynamic detergent systems, it is not surprising that a clear mechanism has not yet been advanced to explain soil suspension during the cleaning operation.

Seventy-seven references to the literature are cited.

Properties of Eastman's Kodel Polyester Fiber

Martin, E V, Papers of AATT, *Modern Textiles* 40, 43-5, Feb, 1959.

A new polyester fiber has been developed by Tennessee Eastman Co and is being marketed under the name Kodel. It is being offered only in staple form at present.

The physical properties of the new fiber and the effect of various chemical agents on yarn and fabric are listed in tabular form.

Kodel fibers melt at 290-295°C. They shrink only about 1% in boiling water and about 3% in air at 220°C. Fabrics can be ironed safely at about 210°C. The fibers burn slowly when ignited, but melt and drop off when hanging free.

Kodel is better in resistance to outdoor exposure than wool and nylon, about equal to cotton, and slightly inferior to acetate.

The fiber has a low moisture regain (0.2%). Tenacity and elongation are practically unaffected by water.

Resistance of Kodel to most acids and alkalis is stated to be excellent. Sodium hypochlorite has a slight bleaching action. Stoddard solvent and carbon tetrachloride have no apparent effect. Perchloroethylene induces very slight shrinkage in fabrics but has no permanent effect on yarn properties.

The author believes that this soft, moderately strong, high-melting, highly resilient fiber should find an important place in the field of "wash-and-wear" and "ease-of-care" apparel fabrics.

Dynamic Changes In Viscose Fibers

Coke, C E, *Can Textile J* 76, 41-9, Mar 20, 1959

Viscose is the pioneer of an ever-increasing number of man-made fibers. It has been available commercially for just over half a century. In that period the fiber properties have been vastly improved, and more improvements will continue into the foreseeable future.

When cellulose from any source is treated with caustic soda and then with carbon bisulfide, a product is obtained which dissolves in water or caustic soda. The resulting liquid is sticky, viscous, and brownish orange in color. This solution of cellulose xanthogenate, when extruded into acid, forms regenerated cellulose.

This process forms the basis of the original British patent issued in 1892 to Cross, Bevan and Beadle. The idea of making textile threads from the cellulose xanthogenate solution came later. It was suggested by Stearn and Topham, who found that if the solution was allowed to stand or "ripen" for three days, a thread could be produced from it. A syndicate was formed in 1899 to promote the spinning of viscose textile filament yarn (referred to originally as "artificial silk").

In 1904 all rights to the various patents on the viscose process were purchased by S Courtauld & Co, and in 1905 the first yarn was produced commercially at Coventry, England. By 1910 production had increased to two million lbs per annum (world production of all forms of viscose yarn in 1957 amounted to five billion lbs).

Various improvements in the process were made in the following years, largely in the spinning mechanism. Meanwhile, the manufacture of viscose yarn was commenced in the US by the American Viscose Co.

Up to 1918 viscose yarn was available only in filament form. In that year a commercial process for making staple fiber was worked out.

In 1926, permanently semi-delustered yarn was produced by incorporating fine globules of oil into the xanthogenate solution. Three years later a fully delustered yarn was developed by substituting finely divided titanium oxide for the oil. This principle was later used to produce colored fibers (spin dyeing).

Through the years the tensile strength of the viscose yarn had been gradually increased by various devices which are described in detail by the author (eg, stretching of the yarn, and changes in the composition of the spinning solution). The high-tenacity yarn so produced now replaces cotton in tire cord.

A recent development now being marketed in North America is a latent crimp filament yarn. The process uses jets of compressed air to "disarray" the filaments and produce loops randomly along their length. This "high-bulk" yarn finds use in carpets and upholstery.

The author suggests that the principle of incorporating finely divided pigments into cellulose xanthogenate solution "may well be broadened to the incorporation of flame retardants, fungicides, antiseptics, deodorizers, and so on."

Thirty references to the literature and patents are cited.

Printing Chrome Colors With Emulsions

Diserens, P, *Dyer* 121, 440-1, Mar 13, 1959

The shortcomings of commercial thickenings when printing chrome colors have caused considerable trouble to printers, as it seems that a part of the thickening reacts with the mordant and thus tends to be retained on the fiber. Recent progress in the field of surfactants, and extensive research in the laboratories of Durand & Huguenin, in Basle, have led to the introduction of "Mulsoprint." With this product it is possible to prepare oil-in-water emulsions of outstanding stability in the presence of mordant, and the principal difficulties when printing chrome colors are overcome.

Mulsoprint is a white, waxy, water-soluble emulsifier; its hydrophilic-lipophilic balance has been chosen so as to produce emulsions of maximum stability and body.

In the new technique, a cheap hydrocarbon solvent is emulsified into an aqueous solution of Mulsoprint. The stability and flow of the emulsion are improved by adding a water-soluble thickening of very high viscosity and low solids content. Proper fixation of the dye is produced by means of thiodiethylene glycol.

The internal oil phase of the emulsion consists of mineral oil. A non-odorous product, not too volatile and with a sufficiently high flashpoint, so as to prevent excessive evaporation and fire hazard, is recommended.

The preparation of the emulsion is very simple, for it requires neither boiling nor filtering. However, adequate mixing equipment, such as a highspeed mixer or a colloid mill, is necessary.

The preparation of printing pastes thickened by means of the emulsion differs little from that of conventional pastes.

When the printing paste enters into contact with the fabric, the emulsion immediately breaks down, and the internal phase diffuses by capillarity, while a halo of mineral spirit forms around the printed object. It is imperative, therefore, to obtain sharp outlines, that the dyestuff and constituents of the printing paste are not soluble in the mineral oil.

The fixation of prints made with emulsions is effected by steaming. Because of the very low content of solid matter in the emulsion, there is nothing to hinder migration of dye and the penetration into the fabric; steaming can, therefore, be very brief.

The advantages claimed for this new process include a soft hand of the prints, improved brightness of shades, economy of dye, better levelness of blotch prints, quicker fixation in steaming, and more rapid removal of unfixed matter in washing.

Role of the Dyestuff Technologist

Balme, P, *Dyer* 120, 949-50, Dec 19, 1958

The arrival of synthetic fibers, coupled with the development of new ranges of dyes for fibers new and old, has made the life of a dyestuff technologist somewhat complicated. The author describes the routine work, including matching shades, checking dyes for shade, fastness, etc, investigating complaints, and helping out when a dyer is ill.

Reference is made to the high-temperature method of wool dyeing developed by the late F L Goodall, which permits dyers to obtain good penetration and levelness on fabrics, especially with dyes giving good wet fastness.

A new method of dyeing union pile fabrics, suggested by O Hertli, is described. This is a single-bath process, conducted under acid conditions (ie, at a pH of 4 to 5). This method is said to avoid the usual crease marks and crushing of the pile which results when dyeing these fabrics in a neutral bath. It is, however, limited to selected direct dyes which will not dye wool.

The dyeing of Acrilan has given trouble due to the long boiling and the strongly acid bath required. The author stated that the neutral-dyeing premetallized dyes may be applied at or near the neutral point, and by dyeing at 120°C the time need not exceed two hours.

Courtelle, the new Acrylic fiber, the writer states, is limited to three classes of dyes. Disperse dyes are suitable only for pale shades. Basic colors are difficult to dye level and have poor reproducibility. Modified

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Calcofluor White Boosts Chalk-White Knit Fashions

"Whiter-than-white"—one of the season's biggest resort fashions in wool, cotton, and man-made fibers—continues in high favor at the retail level, for festive vacation and town wear. With all the wonderful variety of colors available, no wardrobe is complete without white—the whiter the better. The complete range of Cyanamid's Calcofluor White fluorescent dyes—for yarns and fabrics of wool, cotton, orlon, acetate and other fibers—continues to make an important contribution to the great popularity of white.

Vat Dyes Make New York Times Puzzle

If they didn't know it before, crossword puzzle fans now know that the right answer to "fast colors" is "vat dyes." Our hunch is that it was one of the *easiest* answers in the whole puzzle!

Cyanamid vat dyes are easily identified by the trademark *Calcoloid* in the color name. This word signifies that they are manufactured with Controlled Particle Size and carefully formulated to give optimum results in dyeing or printing.

For the answer to *your* vat dye "puzzle" why not specify colors from Cyanamid? You'll be glad you did.

Calcoloid Violet BNC Double Paste: Outstanding Shading Color for Blues, Grays

Calcoloid Violet BNC Double Paste is outstanding among bluish vat violets because of its excellent fastness to heat effects, such as ironing or drying and to moisture effects, such as water spotting and steam pleating. For these reasons it is the violet dye which has unique value for solid shades or for wide striped or large checked patterns on woven or knitted fabrics of cotton or of viscose rayon.

Even in pale shades Calcoloid Violet BNC has excellent fastness to light and in addition *it does not accelerate tendering of the fiber during prolonged sun exposure.* Thus, it is an excellent dye for curtains and draperies.

Because orchid and violet self-shades are of minor interest in the commercial market, *the most important use of Calcoloid Violet BNC Double Paste is for shading light blue and gray shades.* Major end uses are men's shirting fabrics, matched slack and shirt sets and work clothing.

When used for dyeing cloth on jigs, becks, or continuous ranges, or when dyeing yarn in packages, beams or cheeses; the insensitivity of Calcoloid Violet BNC to heat and moisture facilitates quick, accurate and confident shade matching. The level dyeing properties of this dye also make it a valuable color for package, beam or cheese dyeing.

Calcofast Neutral Dyes Produce Fast Colors with Less Acid, Short Dyeing Time; Yield Excellent Results on Wool, Silk, Nylon

Ten dyes with superior working properties now available from Cyanamid with more to come

The Calcofast line of Neutral Wool Dyes now includes Calcofast Neutral Yellow G, Yellow 3R, Orange 2G, Scarlet 2G, Red 6B, Brown B, Brown 5R, Blue B, Gray B and Black BG and enables a wide range of self shades and of combination shades to be produced by the popular neutral dyeing method. Other products will be added to the Calcofast Neutral line as rapidly as the achievements of Cyanamid Research can be converted into plant production.

Calcofast Neutral Wool Dyes require *less dyeing time* than other fast dyes, require much *lower concentrations of acid,* and the dyed material is delivered in *superior physical condition* in comparison with wool, silk or nylon dyed with other fast dyes.

The saving in dyeing time, in *chemical and steam consumption* and in *labor* results in *cost savings* which are of vital importance in today's highly competitive textile market.

APPLICATIONS

These dyes are suitable for dyeing on appropriate equipment, wool stock, tops, slubbing, yarn or cloth; silk noils, yarn or cloth; and nylon staple, tow, tops, yarn or cloth and for dyeing blends of these fibers. Because most of the Calcofast Neutral Wool Dyes leave cotton, viscose and acetate virtually unstained or only lightly stained, they are widely used for blends of these fibers with wool, nylon or silk to achieve attractive cross-dye effects. Certain acrylic fibers can be dyed with Calcofast Neutral Wool Dyes by the use of suitable procedures.

PRINTING

Print works find Calcofast Neutral Wool Dyes valuable for fast patterns on wool, nylon, silk and blends of these fibers. Before the advent of this type of metallized dye, there was no simple way to print these fibers, and particularly blends of these fibers, and obtain excellent all-around fastness.

END USES

Typical end uses of fabrics dyed with Calcofast Neutral Wool Dyes are men's suiting and shirting fabrics, ladies wear, bathing suits, sportswear, hosiery, upholstery, rugs and carpets, automotive fabrics and fabrics to meet Government specifications. Dress goods, scarves and ties are among the most important printing applications.

For additional information, contact your Cyanamid Dyes Department representative or write American Cyanamid Company, Dyes Department; Bound Brook, N. J.

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HYDROSULFITE AWC — ($NaHSO_2.CH_2O.2H_2O$) For stripping and discharge printing.
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HYDROSULFITE B Z — ($Zn(OH)HSO_2.CH_2O$) For stripping wool stock, shoddy, rags.
HYDROZIN* — ($Zn(HSO_2.CH_2O)_2$) For stripping acetate dyes and dicharge printing on acetate dyed grounds.
HYDROSULFITE QD—For rapid dissolving in continuous vat dyeing.

DE-SIZING

AMPROZYME*—For liquefaction of starches and proteins in de-sizing textiles.
DIASTAZYME* — Used as an economical de-sizing agent for starch-sized textiles.

SCOURING

ORATOL L-48* — A synthetic detergent with excellent penetrating and emulsifying properties.
BENSAPOL — A liquid detergent derived from Monopole Oil particularly useful for scouring wool.
LOUPOLE W-950—A penetrating detergent for use in scouring or boiling off.
PARNOL—Sodium Dodecyl Benzene Sulphonate.
SELLOGEN* GEL—A synthetic detergent used also in dyeing and as a wetting agent for all natural and synthetic fibre.
DETERGENT W-1750 A — Has anionic and non-ionic properties; execellent for scouring nylon and dacron to remove throwster sizings; penetrates and lifts graphite streaks.

DYEING

WETSIT CONC.*—A synthetic aromatic compound for wetting out in both the dyeing and scouring operations.
WETSIT* NI — 100% non-ionic wetting agent.
MONOPOLE OIL*—A highly concentrated, double sulphonated castor oil for a wide range of operations.
APASOL*—Particularly effective in the dispersion of acetate printing colors. A sulphonated ester with a high combined SO_3.
LOMAR PW*—Dispersing agent for pad dyed vat colors; also retardant in the dyebath.
SULPHONATED OILS—Castor, Cod, Sperm, Olive, Neatsfoot, Pine, Red, Teaseed, etc.

FINISHING

ACETATE OF ALUMINA—Water-clear solution, sulphate and iron free; used for waterproofing.
ALUMINUM FORMATE—For waterproofing; clear, water-white, stable; sulphate, chloride and iron free.
LUPOSEC*—Stable emulsion of mineral waxes with aluminum acetate. For one bath method of water-proofing.
STATLESS—Paste for reducing static on all fibres.
CREAM SOFTENERS—In different strengths and varied degrees of alkalinity for a soft full hand to all types of fabrics.
LUPOMIN*—A series of cationic nitrogen compounds used for softening and finishing textiles.
CHAFE REMOVER W-545-T—A finishing oil for textiles, particularly silk fabrics, to remove chafe marks.
LUXAPOLE W-1054-B—A superior, sulphonated oil for finishing all fine fabrics.
OIL S-261C—A clear, amber oil used as a penetrator and softener for cotton cloth; aids in uniform shrinkage.
SOLUBLE WAX JB—A dispersed vegetable wax for full body and high luster to cotton goods.
WEIGHTER FINISH M—For heavier body and better hand for all fabrics.

PRINTING

SUPERCLEAR* — Prepared from natural gums as a thickener for printing all types of textiles.
SUPERGUM—A cold-water soluble gum.
PIGMENT WHITES—Dispersed suspension of white pigments with plasticizers for use on light grounds, or white discharge on dyed ground shades.
ACETATE OF CHROME—As a mordant in dyeing and printing mordant colors. Also for dyeing mineral shades.
TRAGACANTH—Gum solutions in various concentrations for extra clear, sharp prints when used with acid, direct or insoluble Azo dyestuffs.

OTHER SPECIALTIES

Mordants	Gums—Arabic, Karaya and Tragacanth
Defoamers	Fiber Lubricants
Sizes	Thickeners
Delustres	Wool Oils
Penetrants	Sulphonated Oils (Various Bases)
Weighting Finish	

JACQUES WOLF & CO. Chemicals PASSAIC, N. J.

*Reg. U.S. Pat. Off.

Representatives: Providence, R. I., Chicago, Ill., Greensboro, N. C., Greenville, S. C., Philadelphia, Pa., Boston, Mass., Los Angeles, Cal.

basic dyes (eg, Maxilons) have excellent lightfastness, but are rather expensive. High-temperature dyeing, the author says, fails to give any reasonable build-up with any other class of dye except the neutral premetallized dyes.

In Quest of the Ideal Detergent Formula

Ward, C F, *Man-made Textiles* **35**, 57-8, Mar, 1959

The author enunciates five properties which should be expected of a washing preparation. First, it must remove dirt. Then it must be stable to hard water, it must not chemically attack the material being washed, it must not produce any unwanted physical changes (eg, in color) when used under conditions advised by the makers. Finally, it should have a wide safety margin. To these can be added a few more to satisfy the domestic user. If the detergent is in powder form, it should not cake on storage, it should flow freely to enable the correct amount for use to be gauged, and its constituents should dissolve quickly and at a uniform rate.

Some of these properties are chemical and some are physical. Each is important in its suitability as a washing agent.

One of the greatest problems facing the cleaner is in the multifarious character of the laundry, which consists at one and the same time of heavy and light materials, small and large garments, and colored and white materials. Added to this, the laundry may and will consist of natural and man-made fibers, hydrophilic and hydrophobic fibers, and of mixtures of these. Depending on the major fiber present and the fabric construction, the dirt may be removed quickly, or it may cling tenaciously to the article being washed.

Fortunately, with detergents there are many types which enable the washer to choose one of the most suitable for the batch of laundry in question. First, there are both solid and liquid detergents from which a choice can be made. They are usually made up of the basic detergent with builders and suspending agents, together with coloring matter, optical whitening agents, and sometimes chemical bleaching compounds.

Solid detergents can be placed in three categories:

1) Spray-dried mixtures of water-soluble anionic synthetic detergents of the sulfuric reaction product type, containing large amounts of alkali metal tripolyphosphate.

2) Spray-dried products based on the sodium salts of alkyl sulfuric esters of higher alcohols obtained by the reduction of tallow and coconut oil.

3) Compounds based on sodium polypropylene benzene sulfonate with 9-18 carbon atoms and preferably from 12-15 in the polypropylene chain, and mixtures thereof.

Detergents of type 1), as described in a Procter & Gamble patent, consist of water-soluble salts of an organic sulfuric ester or of an organic sulfonic acid with 2-5 times its weight of polyphosphates. This type is said to combine heavy-duty cleansing performance, resistance to curd formation in hard water, and mildness towards colored fabric.

The author describes the proper procedure for assembling the various ingredients of a commercial detergent, and discusses various products which have been proposed as additions to improve the detergent's physical and other properties. One composition cited contains as many as twelve components, including perfume(!).

Some Observations on the Mechanism of Detergency

Harker, R P, *J Textile Inst* **50**, T189-222, Feb, 1959

One of the oldest applied techniques known to man, and certainly one of great importance to the Textile Industry, is the washing process. It is, therefore, somewhat surprising, says the author, that only in the past two or three decades has any real progress been made in understanding the fundamental mechanisms involved.

Early ideas of saponification by the free alkali produced by hydrolysis of soap were shown to be untenable, and later proposals eventually led to the solubilization theory. This has proved to be not as important as was thought at first, but it may have some bearing on detergent action where high concentrations of surface-active material are involved. Theories of emulsion stability have been advanced, but these do not explain how, for instance, grease is removed from a fiber and dispersed as an emulsion. N A Adam made an outstanding contribution to existing knowledge by demonstrating microscopically how spheres of oil form by a "rolling-up" process, eventually leading to an oil-in-water emulsion, which is the known end-product of an aqueous washing process. He also discussed the various physical criteria likely to influence the detergent process.

Various workers, particularly in the field of aqueous laundering, have pursued this line of investigation, more or less successfully. However, it is unfortunate from an academic point of view, according to the author, that the majority of workers have chosen rather complex or ill-defined soils with which to work.

The effects of pH, salts and builders have been investigated, and interesting side effects, such as the occurrence of stable water droplets inside the oil drops of an emulsion (described by D G Stevenson) have also received some attention.

The work reported in the present paper is part of a photo-micrographical study of the way in which various soils are removed from a series of fibers, particular reference being made to the washing of raw wool. The fibers tested, besides wool, included polythene, Terylene, nylon (several types), jute and polytetrafluoroethylene. The soil types used included paraffin oil, olive oil, and oleic acid. The detergents employed were chiefly Lissapol N and sodium myristate. The results are presented as a series of photomicrographs, which demonstrate the relative ease with which soils of differing polar character are removed from fibers having different chemical structures.

The following general conclusions were reached by the author:

1) The more polar the fiber, the more easily can oily soil be removed from its surface by normal detergent action. Very polar soils are most easily removed. Where either fiber or soil is very apolar, polar additives to the soil, particularly molecules containing a functional group, will assist in grease removal, either by chemical or physico-chemical interaction.

2) The aqueous droplets shown by Stevenson to arise by osmosis have been examined, and it is suggested that the droplets found in wool-scouring emulsions are formed by a different mechanism.

3) The removal of raw wool grease has been examined, and in the light of photographic evidence a mechanism for the mode of removal has been proposed.

4) Evidence of the existence of a polar barrier which operates during the solvent extraction of scoured wool has been advanced in support of analytical data published earlier.

Forty-two references to the literature are cited.

Tear sheets of articles which have appeared in AMERICAN DYESTUFF REPORTER since July, 1956 are available in limited quantities. (Consult year-end indexes for list of titles). These may be obtained by sending a stamped, self-addressed envelope along with a request for the specific articles. Write TEAR SHEETS, American Dyestuff Reporter, 44 East 23rd St, New York 10, NY.

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News of the Trade

FMC to Expand Central Research Facilities

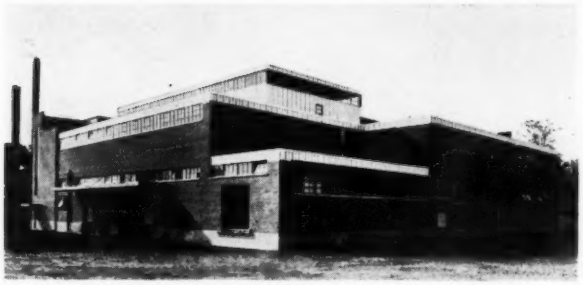
Carl F Prutton, executive vice president of the Chemical Divisions of Food Machinery and Chemical Corporation, has announced the start of construction of a major addition to the Central Chemical Research Laboratory at Princeton, NJ. The expansion, in the form of a new wing, will add more than 50 percent to the laboratory floor space. Slated for use in February, 1960, the new section will cost around $1,000,000.

Dr Prutton stated that the recently formed Inorganic Chemicals Research and Development Department, under the direction of Hans O Kauffmann, will occupy most of the new wing, using it to increase product application and sales-service activities. Dr Kauffmann's group includes the research staffs formerly associated with Becco Chemical Division, Westvaco Chlor-Alkali Division and Westvaco Mineral Products Division. FMC's Organic Chemicals Research and Development Department, including Niagara Chemical Division and Chemicals and Plastics Division, are under the direction of O H Johnson.

The staff of FMC's Princeton laboratory will be increased from its present level of 150 to about 200 when the new wing is completed, and is expected to go to 250 a year or so thereafter.

Morningstar-Paisley Doubles Output of PVAc

Production of polyvinyl acetate emulsions has begun at the recently completed Morningstar-Paisley plant in Clifton, NJ, according to an announcement by Murray Stempel, president. In the same announcement it was also revealed that the company's Chicago plant has increased its output of these emulsions by 50%. As a result, total Morningstar production of these materials has been doubled. Mr Stempel states that the additional facilities were made necessary by the increasing use of polyvinyl acetate emulsions in a wide number of fields, including water-resistant coatings for textiles and binders for nonwoven fabrics. Morningstar furnishes polyvinyl acetate emulsions under the trade name of Vinymuls in amounts ranging from five-gallon containers to carlots. These are produced to meet customer specifications.



New Morningstar-Paisley plant at Clifton, N J

The Clifton facility will give Eastern users faster delivery and closer contact with Morningstar's technical service and production team, it is stated. Standardization of products made in Clifton and Chicago has been attained through duplicating equipment in both plants. Quality-control equipment and instrumentation is utilized to assure uniform emulsion properties from batch to batch.

In addition to the production of polyvinyl acetate emulsions, the Clifton plant also includes a facility for manufacturing liquid vinyl chloride and natural and synthetic latex compounds, which went on stream late last year.

Progressive Color Now Hostachem Corp

On May 1, 1959, Progressive Color and Chemical Co, Inc, 350 Fifth Ave, New York, NY, became known as Hostachem Corporation. The personnel and the address will remain the same.

Known for forty years as Progressive Color and Chemical Co, Inc, this company decided to identify itself more closely with the origin of its products—namely, those of Farbwerke Hoechst AG, Frankfurt-Hoechst, West Germany.

The word Hosta. represents the ancient Roman version of what is now called Hoechst—the name of a suburb of Frankfurt, West Germany, where Farbwerke Hoechst AG was founded almost 100 years ago and where it still maintains its headquarters and major plant facilities.

As Progressive has done in the past, Hostachem Corp will continue to act as distributors in the United States for Farbwerke Hoechst AG and its subsidiary companies: Knapsack-Griesheim AG; Kalle & Co, AG; Anorgana GmbH; and Behringwerke AG.

UBS, Staley to Merge

The managements of A E Staley Mfg Co, Decatur, Ill, and U B S Chemical Corp, Cambridge, Mass, have agreed on a merger of U B S into Staley on the basis of the exchange of one share of common stock of Staley for each one and three-quarter shares of common stock of U B S. The preferred stock of U B S is to be retired prior to the merger.

The merger will require the issuance of approximately 102,000 shares of Staley common presently authorized but not outstanding.

Consummation of the merger is contemplated for this summer and is subject to approval of stockholders of both companies and to completion of legal and other studies now underway.

All—Fabulized Demonstration Program

Lever Brothers, manufacturers of All detergent, has joined with the Fabulized Division of W F Fancourt Co in a continuing program aimed at demonstrating how All detergent washes Fabulized garments. The announcement was made by John L Fancourt, president of Fabulized, at the 44th Knitting Arts Exhibition, just concluded in Atlantic City.

Mr Fancourt said that the two firms will have 12 home economists and ten sales promotion representatives on the road constantly visiting department stores, specialty shops and women's groups. The home economists will give demonstrations of All and its results in the washing of Fabulized materials.

Mr Fancourt said that the program will get under way immediately and will be intensified in the autumn. Lever Bros representatives will work with Fabulized licensees to develop additional promotion programs.

NCTE Reviews Cotton Research at SURDD

The National Council for Textile Education, at its biannual meeting in New Orleans, reviewed cotton research at the US Department of Agriculture's Southern Utilization Research and Development Division. Particular attention was focused on improvements in "wash-and-wear" techniques and new and improved textile machinery developments.

J David Reid, of the Cotton Chemical Laboratory, discussed with Council members current research problems and demonstrated results of some of the newer methods developed by Agricultural Research Service scientists for the finishing of cotton fabrics. Fundamental work to supplement practical work on "wash-wear" to produce the best possible finishes for drip and tumble drying of cotton garments was described.

Chemist George L Drake Jr discussed promising research under way on whole cloth and cotton garments for wrinkle resistance and crease retention. He demonstrated with treated and untreated fabrics the labor-saving value of these treatments developed at the Southern Laboratory.

Several members of the Council stated that, as a result of the keen interest in "wash-wear" cotton garments, textile schools have begun to reappraise their programs. At least one Council member stated that his textile college is making tentative plans to offer a course in "wash-wear" techniques in the near future.

Other matters of interest to Council members were the exhibit of the electron microscope by Mary L Rollins and slides showing its superiority in capturing minute details at great magnifications as compared to the conventional microscope, and experimental equipment in the textile mill and pilot plant.

C H Fisher, Laboratory director, greeted the Council representatives.

Attending the meeting were Cleveland L Adams, head of the School of Textile Technology at Alabama Polytechnic Institute, Auburn, Ala; Malcolm E Campbell, dean, School of Textiles, North Carolina State College, Raleigh, NC; John H Dillon, director, Textile Research Institute, Princeton, NJ; L H Hance, president, Institute of Textile Technology, Charlottesville, Va; Don Partridge, dean of students, Philadelphia Textile Institute, Philadelphia, Pa; Martin J Lydon, president, Lowell Technological Institute, Lowell, Mass; and James L Taylor, director, A French Textile School, Georgia Institute of Technology, Atlanta, Ga.

ACHEMA 1961

The ACHEMA Congress 1961, 13th Exhibition Congress of Chemical Engineering organized by the Deutsche Gesellschaft fur chemisches apparatewesen (DECHEMA) will be held in Frankfurt (Main), Germany, June 9-17, 1961. It will once again include the following groups of exhibits: research and literature, new chemical substances, nuclear science and techniques, laboratory techniques, measurement control and automation techniques, structural materials techniques, works techniques, pumps and fittings, packaging techniques, auxiliary materials and consumable stores, accident prevention and works safety precautions.

Marketing of Creslan to Begin

Initial marketing of American Cyanamid Company's Creslan acrylic fiber to the knit goods trade is about to begin.

From preliminary marketing projects, Creslan applications will spread into more than a dozen basic knitwear fields, it is stated. Creslan is claimed to possess "a perfect balance of vital performance properties." The new fiber's warm and luxurious hand, its light weight, its dimensional stability and wrinkle resistance, and "its unmatched dyeability," have been cited Cyanamid officials.

Selective marketing and trademark-quality control programs developed by Cyanamid for Creslan are said to reflect the company's consideration of "the need for providing new stability, growth and profits" in the knit goods field.

Montecatini Polypropylene Plastic to be Produced in UK

License agreements for the industrial exploitation in the United Kingdom by Imperial Chemical Industries and Shell Chemical Co of the Montecatini and Montecatini-Ziegler patents covering the production of polypropylene for plastic uses (manufactured and sold in Italy under the trade-mark Moplen) have been completed. Both licensees have announced that plant construction will begin immediately.

Covered in major countries by patents or patent applications, the Natta inventions are expected to have far-reaching industrial consequences since they not only include the new polypropylene plastic material, but are the starting point for textile fibers and elastomeric substances having new and interesting properties.

PTI to Stress Executive-level Program

Development of a dynamic executive level educational program, along with expanded research for industry, will be stressed by Philadelphia Textile Institute in the coming decade. These twin goals were announced recently by Bertrand W Hayward, PTI president.

The program is a highlight of the college's Diamond Jubilee Year. Under it, a degree course in marketing and management is now being offered.

"It is aimed," said Dr Hayward, "at providing students with a more thorough understanding of the overall factors at work in the textile field. It also seeks to give them the skill required to interpret these factors and put them to best advantage in management decisions.

"Philadelphia Textile Institute, in short, is rising to the challenge created by the growing need for executive-caliber personnel for the industry."

He explained that initiation of the degree course in marketing and management, along with degree courses in textiles, chemistry and design, helps to meet this challenge. All courses have been strengthened with arts and science subjects to assure students of a more complete, well-rounded general education.

It will provide students and industry alike," he said, "with the invaluable and comprehensive technology-plus-business background so necessary for progress."

Dr Hayward said the expanded research program will permit wider utilization of Philadelphia Textile Institute's modern facilities by the textile industry. This will be achieved both through Government and private contracts that investigate specific applications and through general research for the benefit of the entire industry.

Chemore Moving to Larger Quarters

Chemore Corp, general representatives in the United States and Canada for Montecatini Soc Gen, Milan, Italy, has moved to new and larger quarters at 2 Broadway, New York 4, NY.

As Montecatini's representative, Chemore Corp markets a wide variety of chemicals, dyestuffs and plastics. It has been instrumental in negotiating license agreements with several US chemical firms for chemical processes developed by Montecatini.

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NID, JI to Study Shrinkage Control of Jersey Knits

A study of how to control shrinkage of jersey knit goods will be undertaken jointly by the National Institute of Drycleaning and the Jersey Institute. The two institutes laid plans for this at a meeting recently in Silver Spring, Md, at the headquarters of NID. The study will attempt to determine the cause of increasing numbers of consumer complaints of shrinkage which occur after the drycleaning of jersey garments made of 100% wool, and Orlon and wool blends.

Research carried out by NID last year showed that the shrinkage occurs in steam finishing or pressing, not in the drycleaning process itself. Complaints of this type were first noted by NID early in 1958. Since then the number of complaints handled by the Institute's Textile Analysis Department has increased steadily. Last year a total of 264 complaints were investigated. So far this year, 127 cases of jersey shrinkage have been received.

Speaking for the representatives of the Jersey Institute, Ben Heller, president of William Heller, Inc, said that a great deal of progress has been made in recent years in improving the serviceability of jersey fabrics. He said, however, that it is well known that jersey fabrics have certain inherent characteristics of construction which require special consideration. He said it is significant that the rise in shrinkage complaints parallels the development of a printed jersey market in the latter part of 1957.

It was agreed that the NID complaint record will in the future make a distinction between print goods of 100% wool and Orlon-wool blends, and plain shade fabrics. Mr Heller said this is important because the control of factors which induce shrinkage in jersey is much more difficult in converting and commission printing operations than it is among the vertical type jersey knitting firms who do their own dyeing and finishing, and have many years experience in the manufacture of jersey.

The proposed study will include an investigation of various steam finishing methods used in drycleaning with a view to determining to what extent shrinkage can be controlled by special steam-finishing techniques. It will also undertake to develop a testing procedure which will provide the manufacturer with a means of evaluating jersey fabrics for shrinkage control in terms of recommended methods of steam finishing. Both piece goods and garments will be used in the study.

In addition to Mr Heller, representatives of the Jersey Institute included: Edward Grossman, Lebanon Fabrics Corp; Gary Frohman, I A Wyner and Co, Inc; Albert Hanson and John DiPrete of William Heller, Inc; Frank Landa, Frank Landa, Inc; and Jesse Ross, Samuel J Kobe Corp.

Representing NID were Albert E Johnson, director of trade relations and chairman of the meeting; Dorothy S Lyle, director of consumer relations; Joseph Wiebush, director of research; W Clay Hardin, chief analyst; Robert T Graham, textile analyst; and A Rothe, Institute Registrar and spotting instructor.

Celanese Reduces Butyl Acrylate Prices

The Chemical Division of Celanese Corp of America has announced a reduction of ten cents a pound in the developmental price of butyl acrylate, a basic chemical used in finishes for textiles and leather and other industrial products.

The new price is 45 cents a pound in tank car quantities, 47½ cents in carload and truckload drums, and 48½ cents in lcl drums, freight prepaid in each case. The price is one cent higher for shipments west of the Rockies.

A spokesman for the company said the decrease is being made to broaden markets for the chemical.

Uhde Corp Changes Name

The name of The Uhde Corporation, 350 Fifth Ave, New York, NY, has been changed to Hoechst-Uhde Corporation, according to F B Grosselfinger, president.

Hoechst-Uhde Corp, a subsidiary of Farbwerke Hoechst AG, Frankfurt-Hoechst, West Germany, offers the processes available for licensing from Farbwerke Hoechst AG and its production subsidiaries, as well as processes from the Farbwerke Hoechst AG engineering subsidiary, Friedrich Uhde GmbH.

ACH Organizes Fiber Service Div

American Conditioning House, Inc, has organized a new fiber service division to provide scientifically guided fiber identification, testing and research on man-made and specialty fibers as well as wool.

Herbert J Wollner, president, feels that this service will fill a growing need of the textile industry in connection with specialty fibers, the Federal Trade Commission fiber identification rules, and the trend towards reliable fiber evaluations.

A feature of the program will be consultation by members of the professional staff, to explore sampling and testing methods, tolerances and standards, to determine their reliability and significance in the particular needs of the individual client. Where special situations exist, the organization's research services will attempt to tailor standard procedures to meet the prevailing conditions.

In addition to the existing chemical, engineering and testing laboratories of the American Conditioning House, facilities in microscopy, qualitative and quantitative analysis for fiber content, patent investigations and literature searches have been provided in the expansions of personnel and equipment recently undertaken in anticipation of Fiber Service. The staff includes specialists in chemistry, biology and engineering.

Samuel J Golub, an authority on specialty fibers and wool technology, heads Fiber Service. He is located at the headquarters of the organization, 11 Melcher Street, Boston, Mass.

General Calendar

AMERICAN OIL CHEMISTS SOCIETY
Sept 28-30 (Statler Hotel, Los Angeles, Calif)

AMERICAN TEXTILE MACHINERY ASSOCIATION
May 23-27, 1960 (American Textile Machinery Exhibition, Auditorium, Atlantic City, NJ)

ASSOCIAZIONE COSTRUTTORI ITALIANI DI MACCHINARIO PER L'INDUSTRIA TESSILE
September 12-21 (3rd International Textile Machinery Exhibition, Milan Fair, Milan, Italy)

CANADIAN ASSOCIATION OF TEXTILE COLOURISTS AND CHEMISTS (QUEBEC SECTION)
June 20 (Annual Golf Tournament)

DRUG, CHEMICAL AND ALLIED TRADES SECTION, NY BOARD OF TRADE
Sept 17-20 (69th Annual Meeting, Sagamore Hotel, Bolton Landing, Lake George, NY

GORDON RESEARCH CONFERENCE ON TEXTILES
July 13-17 (Colby Jr College, New London, NH)

NATIONAL COTTON COUNCIL
May 12-14 (1959 Cotton Research Clinic, Grove Park Inn, Asheville, NC)
Oct 7 (Chemical Finishing Conference, Mayflower Hotel, Washington, DC)

SYNTHETIC ORGANIC CHEMICAL MANUFACTURERS ASSOCIATION OF THE UNITED STATES
June 9, Sept 15, Oct 13, Nov 4 (Luncheon meetings at the Hotel Roosevelt, New York, NY); May 11-13 (Spring Outing—The Cavalier, Virginia Beach, Va); Dec 2 (Annual meeting and dinner—Hotel Roosevelt, New York, NY)

TEXTILE RESEARCH INSTITUTE
March 24-25, 1960 (30th Annual Meeting, Hotel Commodore, New York, NY)

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THE PRACTICAL ASPECTS OF NEUTRAL GREASE WOOL SCOURING	25¢
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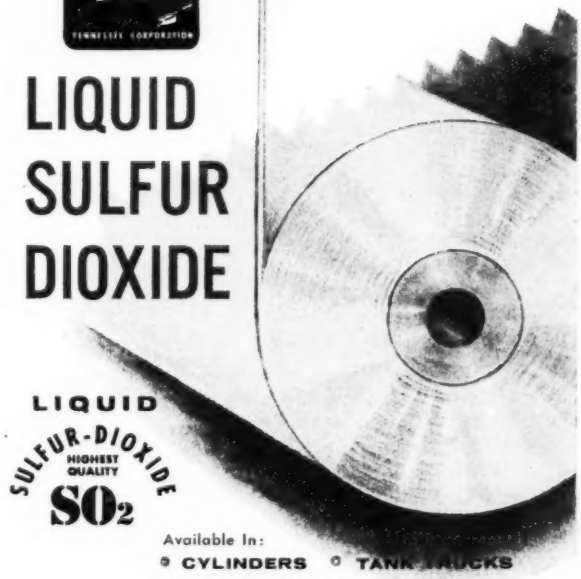

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Rot-Resistant Cotton for Outdoor Use

A practical method for producing cotton fabric with outstanding rot resistance and improved weather resistance has been announced by the US Department of Agriculture.

The improved properties, imparted to cotton through use of a new research-developed chemical treatment, promise to open up new markets for cotton in awnings, tents, tarpaulins, and other outdoor fabric items, it is claimed.

Developed by USDA's Agricultural Research Service, the method is based on the use of a water-soluble acid colloid of methylolmelamine, a chemical well known for its resin-forming qualities. The resin, which penetrates the outer portion of the fiber cell wall to become a part of the fiber rather than just a coating, is said to make cotton virtually immune to rot and mildew as determined by soil burial tests in the laboratory.

In these tests, using soils containing fabric-destroying bacteria, untreated cotton was in shreds after one week. The treated cotton fabric is reported to have retained 100 percent of its breaking strength after 21 weeks.

Research by the ARS Southern Utilization Research and Development Division. New Orleans, La, reportedly has shown that the chemical treatment can be used in conjunction with certain fabric-coloring pigments to increase cotton's resistance to deterioration by sunshine. The treatment can also be applied successfully to many vat-dyed fabrics, it is stated.

Cost of this treatment is expected to be relatively low. The treatment can be applied with conventional textile finishing equipment.

Twitchell 7440

Commercial availability of a new antistatic, water-soluble fiber lubricant, Twitchell 7440, has been announced by Emery Industries, Inc, Cincinnati, Ohio.

Formerly designated as Emery 3198-S in development stages, Twitchell 7440 Lubricant reportedly provides an unusually high degree of static control and effective lubrication for all natural and synthetic fibers at relatively low percent applications.

It is claimed that Twitchell 7440 Lubricant has been approved by the Wool Associates of New York Cotton Exchange, Inc in that wool tops combed with this oil are acceptable for certification and delivery on the Exchange.

Other reported features of Twitchell 7440 Lubricant are its ease of removal through normal scouring procedures, resistance to yellowing, light and storage stability.

These features are said to make Twitchell 7440 an advantageous fiber lubricant for all fibers and blends where static is encountered. Specifically, this includes high speed wool and worsted processing, blends of wools and synthetics, and blends of cotton and synthetics. The static control of Twitchell 7440 is said to be effective on all the common synthetic fibers including nylon, polyesters and acrylics.

Technical Bulletin No. 414, entitled "Twitchell 7440 Lubricant," is available from Emery Industries, Inc, Dept 5, Carew Tower, Cincinnati 2, Ohio.

Eccoblanc W-40

Eccoblanc W-40, a resinous white discharge printing compound, has been announced by Eastern Color & Chemical Co, 35 Livingston St, Providence 4, RI, as a new extension of the company's line of Ecco products.

Said to be noncuring and nonyellowing, Eccoblanc W-40 contains its own resin binder. The new compound is described as good in resistance to washing and drycleaning, and its covering power is said to be excellent.

The thickening agents in Eccoblanc W-40 and the viscosity of the compound are such that they will not thin or diminish in any way the viscosity of the print paste used, it is claimed, thus assuring sharp prints. Permanently white prints are said to be assured by the presence of optical bleaches and a permanent sulfoxolate-resistant bluing in Eccoblanc W-40.

Atco Process Oil

Metro-Atlantic, Inc's Atco Process Oil reportedly can be applied to textured nylon and other synthetic yarns to prevent broken ends and fly in the spinning operation. This oil may be dried right in the yarn, it is claimed, as it does not impart any color to the yarn or develop objectionable odors during storage. However, it can be removed by rinsing the yarn in warm water. Atco Process Oil is usually applied by roller device attached directly to the spinning frame.

Survey of New Products and Processes From Japan

A survey designed to disclose new processes and products, and to develop research leads as well as licensing opportunities, is being conducted in Japan by Aries Associates, Stamford, Conn.

The survey is disclosing that the pattern of Japanese research and development has changed radically in the past ten years. In recent years, Japanese scientists and technologists have developed original processes for organic chemicals, elastomers, plastics, to mention some outstanding samples. Furthermore, extensive improvements have been made on many of the processes they have licensed from abroad, and the Japanese research effort now is larger in size and importance than that of most Western European countries.

In the opinion of Robert S Aries, the survey is revealing many opportunities for the acquisition of profitable technology by U S firms. It is also expected that the information disclosed on the latest Japanese research and technology will point the way to mutually advantageous agreements for the joint development of new products at low cost or the follow up of important, yet relatively neglected, research and development. The survey is also providing realistic information on the competition from low-cost products and indicates the feasibility of export-import arrangements.

The survey is being conducted by a team of Japanese technologists directed by Dr Aries. Leading Japanese chemical process firms, as well as important private and University laboratories, are being contacted.

The survey will be made available on a consulting basis.

Dow Corning Reduces Price of Silicone Defoamer

Dow Corning Corp, Midland, Mich. has announced reductions in price of its Antifoam B silicone defoamer ranging from three to six cents a pound—approximately five percent.

According to O D Blessing, Dow Corning sales vice president, this is the second price reduction for Antifoam B within six months and was made possible by production economies resulting from increased usage and more widespread applications.

This new reduction brings price of Antifoam B to 65 cents a pound in drum quantities.

• NAMES IN THE NEWS •

Daily

Robert T Daily has been appointed manager of marketing for the Silicone Products Department, General Electric Co. Mr Daily succeeds **Jerome T Coe**, former manager of marketing, who was named department general manager in February of this year.

Most recently serving as manager of rubber market development for the Silicone Products Department, Mr Daily has been associated with G-E silicone operations since 1954.

Mr Daily will continue to be located at the headquarters of the Silicone Products Department, Waterford, NY.

Victor R Hurka has been named director of the Technical Laboratory of the Du Pont Company's Dyes and Chemicals Division, succeeding **Crayton K Black**, who became assistant manager of the division's trade relations section on May 1.

In other changes effective the same date, **Kenneth C Johnson** has been named technical assistant in the division's sales development section while **Harry F Clapham** and **Charles A Sylvester** become technical manager and assistant technical manager, respectively, of the dyes section of the division.

Victor R Hurka, for the last three months assistant production manager of dyes and chemicals in the Manufacturing Division of the company's Organic Chemicals Department, began his career with Du Pont as a research chemist in the former Rayon Department in 1941. Since 1942, he has been associated with the Organic Chemicals Department as a research chemist at its Jackson Laboratory and Chambers Works manufacturing facilities at Deepwater Point, NJ.

Crayton K Black joined the Du Pont Company as a research chemist at its Jackson Laboratory in 1929. He has been associated with the Technical Laboratory of the company's Dyes and Chemicals Division since 1935, and was named director of the laboratory in 1954.

Kenneth C Johnson joined Du Pont as a research chemist at its Jackson Laboratory in 1937. In 1950, he was appointed a section manager and in 1955 became technical manager of the department's Dyes Division.

Harry F Clapham joined the Du Pont Company in 1935 as a laboratory assistant in the Technical Laboratory of its Dyes and Chemicals Division. He was named sales supervisor of the New York district office of the Dyes and Chemicals Division in 1953, and assistant technical manager of the division's dyes section in 1954.

Charles A Sylvester joined the Dyes and Chemicals Division Technical Laboratory staff in 1928. He was named supervisor of the Dye Properties Division in 1949, a position he held until last year when he became assistant manager of the division's trade relations section. Active for many years in AATCC, Mr Sylvester currently is vice chairman of its Executive Committee on Research and chairman of its Technical Committee on Research.

Campbell

Curry

Evers

Three changes in the administration of Celanese Corp of America's Central Research Laboratories at Summit, N J, have been announced.

J Stewart Campbell has been named manager of laboratory services, **Michael J Curry** has been appointed manager of the Plastics Research Department and **William J Evers** has been made manager of the newly created Exploratory Polymer Research Department. The new department consolidates the exploratory polymer work previously done in two other departments.

J W Stevens

The appointment of **John W Stevens** as vice president, marketing, Century Chemical Corp, has been announced. The company, which has its executive offices at 60 East 42nd St, New York, NY, manufactures pigments, dyestuffs and intermediates.

In his new capacity, Mr Stevens will work directly with President Theodore S Hodgins on planning, organizing and integrating all of Century's marketing and sales activities in the United States and abroad.

Mr Stevens, before joining Century Chemical, was vice president in charge of marketing and sales for Reichhold Chemicals, Inc. He has also served as general sales manager for Celanese Corporation of America's chemical operations.

The appointment of **Arnold C Corwin** to the fiber end-use development staff of Allied Chemical Corporation has been announced by National Aniline Division.

Mr Corwin will serve as a textile technologist specializing in the application of Allied's new nylon fiber, Caprolan, to home furnishings and apparel fabrics. He will report to **Fred W Noechel**, manager of Fiber End-Use Development.

Before joining Allied Chemical, Mr Corwin was manager of the Converting Department at Blue Ridge Textile Co.

Promotion of **J W Selden** to general manager, chemical division, has been announced by Minnesota Mining & Manufacturing Co, St Paul, Minn.

Mr Selden, who has been assistant general manager of the division since 1955, succeeds **B J Oakes**, 3M vice president retiring after 31 years of service with the company.

Mr Selden has been with 3M since 1948. Dr Oakes joined 3M in 1928 as chief chemist. He became general manager of the chemical division when it was formed in 1955 and was elected a vice president in 1957.

Chalmer G Kirkbride, president of AviSun Corp and executive director of the Research and Engineering Dept for Sun Oil Company, has announced six appointments to AviSun from Sun Oil.

Carl A Setterstrom has been named assistant to the president of AviSun Corp and also was named director of that company's commercial development division.

Edward T Severs has been named AviSun's product manager—polymers, in the commercial development division; and **Earl M Honeycutt** as manager of manufacturing—polymers.

Three other Sun men have been named product engineers—polymers, in commercial development, for AviSun. They are **A Ross Adams, Neil A Hansen** and **James C Warren.**

AviSun Corporation is an equally owned affiliate of American Viscose Corp and Sun Oil Co. Established in February of this year, AviSun is scheduled later this year to be the Nation's second and the largest commercial supplier of polypropylene from facilities at Port Reading, NJ. The company will manufacture, process and market resins, film, fibers, elastomers, surface coatings and adhesives.

Mr Setterstrom has been assistant director of Sun's Research and Development division since he joined that company in September, 1958.

Dr Severs joins AviSun from a post as staff assistant to the manager of product development in Sun Oil's Research and Development division.

Mr Honeycutt was formerly manager of Sun's process development, Research and Development division.

Dr Adams, prior to his recent transfer to AviSun, joined Sun this February as a research chemist.

Mr Hansen and Mr Warren had been chemical engineers in the commercial development group in Sun Oil Co's Research and Development division.

An intensified program of two to six months sales and technical training devoted to products and markets for Ciba chemical specialties is being initiated this Spring at Ciba world headquarters in Basle, Switzerland. Shown, l to r are Clyde L Miller, Clinton A Dyer and Peter A Cook, all of whom will participate. Others in the group but not shown here are John G Signorino and J J Triska.

C E Stevens

The Dyestuff & Chemical Division of General Aniline & Film Corp has announced the appointment of **Chapin E Stevens** as director of commercial development and **Allen Jaffy** as Division controller.

Mr Stevens, manager of sales development for the Division since 1956, succeeds **Jesse Werner,** recently appointed a vice president of GAF.

Mr Jaffy, prior to this latest appointment, was manager of administrative services and long-range planning for the International Division of General Foods Corp.

Samuel Lee has joined the Textile Pigment Development Laboratories for the Dyestuffs Division of Geigy Chemical Corp.

Mr Lee will be responsible for laboratory research and development of pigments used in textile printing.

Mr Lee comes to Geigy from the American Home Foods Division of American Home Products Inc, where he served as director of research.

He was also formerly associated with Interchemical Corporation as head of new products evaluation for the company's Textile Colors Division.

H W Butterworth & Sons Company Div, Van Norman Industries, Inc, has announced the resignation of **Edward S Pierce,** vice-president.

Mr Pierce joined the Company in 1938 and was formerly assistant sales manager, sales manager, and general manager. Since the Company's merger with Van Norman in January, 1956, Mr Pierce has been vice-president in charge of sales, engineering, research and development, and advertising. He is planning a vacation before announcing his future plans.

Raymond A All has been named to the newly created post of director of marketing for the textile division, United States Rubber Co.

Mr All, who will have overall responsibility for long-range planning, merchandising, sales, market development, advertising and sales promotion, has been with US Rubber Co since 1937. January 1, 1956, he was appointed assistant to the vice president and general manager, his last position before the new appointment.

Joseph A Golden, senior vice president of Burlington Industries, has been named chairman of the Foster Alumni Campaign of Philadelphia Textile Institute's Diamond Jubilee Progress Fund.

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